

CONTRACT AND SPECIFICATIONS

FOR

CONSTRUCTION OF

25X1A

EXTERIOR DUPLEX DWELLINGS,

FAMILY DWELLINGS

AND

EXTERIOR UTILITIES THERETO

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JOB NO. 78-05327A FOR NO. 3 FLD NO. 9 DOC NO. 1
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JUNE

1954

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CONTRACT FOR CONSTRUCTION

THIS CONTRACT, entered into this 30th day of June 1954,
by the UNITED STATES OF AMERICA (hereinafter called the Govern-
ment) represented by the Contracting Officer executing this


called the Contractor), witnesseth that the parties hereto do
mutually agree as follows:

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ARTICLE 1. Statement of Work. The Contractor shall furnish all supervision, plant, labor, materials, equipment, supplies, transportation, including fuel, power and water (except any materials, equipment, utilities or services, if any, specified herein to be furnished by the

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[REDACTED]

work, complete, for the consideration stated in the attached schedule of unit prices, in strict accordance with the specifications, schedules, drawings, and conditions all of which are made a part hereof and designated as follows:

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[REDACTED]

consisting of: Part I, Statement of Work, SW-1 and SW-2;
Part II, General Conditions, GC-1 through GC-15;
Part III, Special Conditions, SC-1 through SC-26,
including SC-3A, SC-3B and SC-3C;
Part IV, Technical Provisions, Sections 1 through 26;
Appendix A.

(Drawings are designated in Paragraph SC-2 of the specifications)

The work shall be commenced and completed in accordance with Paragraph SC-1 of the specifications.

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UNIT PRICE SCHEDULE



Item No.	Description	Unit	Estimated Quantity	Unit Price US Dollars	Est. Price US Dollars
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A. Family Dwellings

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complete with Contractor-furnished labor, equipment and materials (except the Government-furnished materials listed in Appendix A), including utilities to 5 feet outside the building line, necessary grading and compaction to prepare each dwelling site to established grades as shown on the drawings or directed by the Contracting Officer:

1.	Family Duplex with concrete patio and platform	Ea	4	18,498.35	73,993.40
2.	Type C-2 Family Dwelling	Ea	4	10,706.00	42,824.00

Sub-Total (Estimated) - A. Family Dwellings ----- \$ 116,817.40

UNIT PRICE SCHEDULE

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[REDACTED]

Item No.	Description	Unit	Estimated Quantity	Unit Price US Dollars	Est. Price US Dollars
B. Work from 5 Feet Outside the Building Line					
3.	Excavation, grading, unclassified (except dwelling site)	CY	190	0.34	64.60
4.	Sidewalk, concrete, 4 inches thick by 4 feet wide, in place, complete	SY	680	1.73	1,176.40
5.	Pipe, sewer, concrete, lined, 6-inch diameter, in place, complete, including surface cleanouts, connection to existing lines, trenching and backfilling	LF	740	1.25	925.00
6.	Connection to existing sewer manhole, complete	Ea	2	2.75	5.50
	Pipe, water, W.I., in place, complete, including key stops, cast-iron box, fittings, connection to existing lines, trenching and backfilling:				
7.	1 1/2-inch diameter	LF	145	1.25	181.25
8.	1 1/2-inch diameter	LF	485	1.35	654.75
9.	Garbage stand, concrete, in place, complete	Ea	6	18.30	109.80
10.	Tank, steel, coated, underground, 300 gallon capacity, in place, complete, including straight fill assembly, vent assembly for standard 5-foot distance, double extractor assembly, excavation and backfilling	Ea	6	260.98	1,565.88
11.	Oil supply line, 1/4 inch O.D. copper tubing, type K, in place, complete, including all necessary fittings and connections to tanks and lines outside the building line, trenching and backfilling	LF	400	0.85	340.00
12.	Vent pipe, 1 1/2 inch diameter, steel, galvanized, each additional foot over the standard 5-foot distance, in place, complete, including all necessary fittings, trenching and backfilling	LF	165	1.22	201.30
13.	Removal and disposal of 120/240V 3 conductor distribution line to buildings to be dismantled including conductors on poles, service drops, poles, hardware and guys	Job	1	104.38	104.38

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UNIT PRICE SCHEDULE

Item No.	Description	Unit	Estimated Quantity	Unit Price US Dollars	Est. Price US Dollars
B. Work from 5 Feet Outside the Building Line					
(Cont'd)					
14.	Installation of Government-furnished 37½ KVA transformer, complete, with crossarms, insulators, fuse cutouts and relocation of existing 37½ KVA transformer	Job	1	197.85	197.85
15.	Installation of disconnect switches, including mounting frame, conduit risers, weather heads, wiring and switch-to-ground conduit	Job	1	822.36	822.36
16.	4-inch steel pipe underground cable street crossing including excavation, backfilling and road repair	Job	1	99.46	99.46
	Cable, direct burial, in place, complete, including all connections, trenching and backfillings				
17.	2 single conductor No. 4/0 AWG, 600V and 1 No. 2 AWG bare copper	LF	275	2.30	632.50
18.	2 single conductor No. 1/0 AWG, 600V and 1 No. 2 AWG bare copper	LF	750	1.60	1,200.00

Sub-Total (Estimated) - B. Work from 5 Feet Outside the Bldg Line ----- \$ 8,281.03

S U M M A R Y

Sub-Total (Estimated) - A. Family Dwellings ----- \$ 116,817.40

Sub-Total (Estimated) - B. Work from 5 Feet Outside the Building Line----- 8,281.03

TOTAL (ESTIMATED) ----- \$ 125,098.43

they are disturbed. The Contracting Officer shall thereupon promptly investigate the conditions, and if he finds that they do so materially differ, the contract shall be modified to provide for any increase or decrease of cost and/or difference in time resulting from such conditions. If the parties fail to agree upon the adjustment to be made, the dispute shall be determined as provided in the Disputes article hereof.

ARTICLE 5. Termination for Default-Damages for Delay-Time Extensions.

a. If the Contractor refuses or fails to prosecute the work, or any separable part thereof, with such diligence as will insure its completion within the time specified in Article 1, or any extension thereof, or fails to complete said work within such time, the Government may by written notice to the Contractor, terminate his right to proceed with the work or such part of the work as to which there has been delay. In such event the Government may take over the work and prosecute the same to completion by contract or otherwise, and the Contractor and his sureties, if any, shall be liable to the Government for any excess cost occasioned the Government thereby, and for liquidated damages for delay, as fixed in the specifications or accompanying papers, until such reasonable time as may be required for the final completion of the work, or if liquidated damages are not so fixed, any actual damages occasioned by such delay. If the Contractor's right to proceed is so terminated, the Government may take possession of and utilize in completion of the work such materials, appliances, and plant as may be on the site of the work and necessary therefor.

b. If the Government does not terminate the right of the Contractor to proceed, as provided in subparagraph a hereof, the Contractor shall continue the work, in which event he and his sureties, if any, shall be liable to the Government, in the amount set forth in the specifications or accompanying papers, for fixed, agreed, and liquidated damages for each calendar day of delay until the work is completed or accepted, or if liquidated damages are not so fixed, any actual damages occasioned by such delay.

c. The right of the Contractor to proceed shall not be terminated, as provided in subparagraph a hereof, nor the Contractor charged with liquidated or actual damages, as provided in subparagraph b, because of any delays in the completion of the work due to causes beyond his

control which could not reasonably have been anticipated and were without his fault or negligence, including, but not restricted to, acts of God, or of the public enemy, acts of the Government, either in its sovereign or contractual capacity, acts of another contractor in the performance of a contract with the Government, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and unusually severe weather or delays of subcontractors due to such causes; Provided, That the Contractor shall, within 10 days from the beginning of any such delay, unless the Contracting Officer shall grant a further period of time prior to the date of final settlement of the contract, notify the Contracting Officer in writing of the causes of delay. The Contracting Officer shall ascertain the facts and the extent of the delay and extend the time for completing the work when in his judgment the findings of fact justify such an extension, and his findings of fact thereon shall be final and conclusive on the parties hereto, subject only to appeal as provided in the Disputes article hereof.

ARTICLE 6. Disputes. Except as otherwise provided in this contract, any dispute concerning a question of fact arising under this contract which is not disposed of by agreement shall be decided by the Contracting Officer, who shall reduce his decision to writing and mail or otherwise furnish a copy thereof to the Contractor. Within 30 days from the date of receipt of such copy, the Contractor may appeal by mailing or otherwise furnishing to the Contracting Officer a written appeal addressed to the

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shall, unless determined by a court of competent jurisdiction to have been fraudulent, arbitrary, capricious, or so grossly erroneous as necessarily to imply bad faith, be final and conclusive upon the parties hereto when the amount involved in the appeal is \$50,000 or less: Provided, That if no appeal is taken within the said 30 days, the decision of the Contracting Officer shall be final and conclusive. When the amount involved is more than \$50,000 the decision

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representative for the hearing of such appeals shall, unless

determined by a court of competent jurisdiction to have been fraudulent, arbitrary, capricious, or so grossly erroneous as necessarily to imply bad faith, be final and conclusive: Provided, That if no such further appeal is taken within the said 30 days, the decision [REDACTED]

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[REDACTED] shall be final and conclusive. In connection with any appeal proceeding under this article, the Contractor shall be afforded an opportunity to be heard and to offer evidence in support of its appeal. Pending final decision of a dispute hereunder, the Contractor shall proceed diligently with the performance of the contract and in accordance with the Contracting Officer's decision. Notwithstanding the provisions of this article, the Contractor shall have such right of appeal to the court of claims as is provided by Sec. 635, Public Law 488, 82d Congress.

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ARTICLE 7. Payments to Contractors.

a. Unless otherwise provided in the specifications, progress payments will be made as the work progresses at the end of each calendar month, or as soon thereafter as practicable, or at more frequent intervals as determined by the Contracting Officer, on estimates approved by the Contracting Officer. In preparing estimates the material delivered on the site and preparatory work done may be taken into consideration.

b. In making such progress payments there shall be retained 10 percent on the estimated amount until final completion and acceptance of all work covered by the contract: Provided, however, that the Contracting Officer, at any time after 50 percent of the work has been completed, if he finds that satisfactory progress is being made, may make any of the remaining progress payments in full: Provided, further, that if the Contracting Officer determines that the work is substantially complete and that the amount of retained percentages is in excess of the amount considered by him to be adequate for the protection of the Government, he may at his discretion release to the contractor such excess amount: And provided further, That on completion and acceptance of each separate building, vessel, public work, or other division of the contract, on which the price is stated separately in the contract, payment may be made in full, including retained percentages thereon, less authorized deductions.

c. All material and work covered by progress payments made shall thereupon become the sole property of the Government, but this provision shall not be construed

as relieving the Contractor from the sole responsibility for all materials and work upon which payments have been made or the restoration of any damaged work, or as a waiver of the right of the Government to require the fulfillment of all of the terms of the contract.

d. Upon completion and acceptance of all work required hereunder, the amount due the Contractor under this contract will be paid upon the presentation of a properly executed and duly certified voucher therefor, after the Contractor shall have furnished the Government with a release, if required, of all claims against the Government arising under and by virtue of this contract, other than such claims, if any, as may be specifically excepted by the Contractor from the operation of the release in stated amounts to be set forth therein. If the Contractor's claim to amounts payable under the contract has been assigned under the Assignment of Claims Act of 1940, 54 Stat. 1029 (41 U. S. C. Sec. 15), a release may also be required of the assignee at the option of the Contracting Officer.

ARTICLE 8. Materials and Workmanship. Unless otherwise specifically provided for in the specifications, all workmanship, equipment, materials, and articles incorporated in the work covered by this contract are to be of the most suitable grade of their respective kinds for the purpose. Where equipment, materials, or articles are referred to in the specifications as "equal to" any particular standard, the Contracting Officer shall decide the question of equality. The Contractor shall furnish to the Contracting Officer for his approval the name of the manufacturer of machinery, mechanical and other equipment which he contemplates incorporating in the work, together with their performance capacities and other pertinent information. When required by the specifications, or when called for by the Contracting Officer, the Contractor shall furnish the Contracting Officer for approval full information concerning the materials or articles which he contemplates incorporating in the work. Samples of materials shall be submitted for approval when so directed. Machinery, equipment, materials, and articles installed or used without such approval shall be at the risk of subsequent rejection. The Contracting Officer may in writing require the Contractor to remove from the work such employee as the Contracting Officer deems incompetent, careless, insubordinate, or otherwise objectionable, or whose continued employment on the work is deemed by the Contracting Officer to be contrary to the public interest.

ARTICLE 9. Inspection.

a. Except as otherwise provided in subparagraph d hereof, all material and workmanship (if not otherwise designated by the specifications) shall be subject to inspection, examination, and test by representatives of the Contracting Officer at any and all times during manufacture and/or construction (and at any and all places where such manufacture and/or construction are carried on.) The Government shall have the right to reject defective material and workmanship or require its correction. Rejected workmanship shall be satisfactorily corrected and rejected material shall be satisfactorily replaced with proper material without charge therefor, and the Contractor shall promptly segregate and remove the rejected material from the premises. If the Contractor fails to proceed at once with the replacement of rejected material and/or the correction of defective workmanship the Government may, by contract or otherwise, replace such material and/or correct such workmanship and charge the cost thereof to the Contractor, or may terminate the right of the Contractor to proceed as provided in the Termination for Default-Damages for Delay-Time Extensions Article of this contract, the Contractor and surety being liable for any damage to the same extent as provided in said Article for terminations thereunder.

b. The Contractor shall furnish promptly without additional charge, all reasonable facilities, labor, and materials necessary for the safe and convenient inspection and test that may be required by the Contracting Officer. All inspection and tests by the Government shall be performed in such manner as not unnecessarily to delay the work. Special, full size, and performance tests shall be as described in the specifications. The Contractor shall be charged with any additional cost of inspection when material and workmanship is not ready at the time inspection is requested by the Contractor.

c. Should it be considered necessary or advisable by the Government at any time before final acceptance of the entire work to make an examination of work already completed, by removing or tearing out same, the Contractor shall on request promptly furnish all necessary facilities, labor and material. If such work is found to be defective or non-conforming in any material respect, due to fault of the Contractor or his subcontractors, he shall defray all the expenses of such examination and of satisfactory reconstruction. If, however, such work is found to meet the

requirements of the contract, the actual direct cost of labor and material necessarily involved in the examination and replacement, plus 15 percent, shall be allowed the Contractor and he shall, in addition, if completion of the work has been delayed thereby, be granted a suitable extension of time on account of the additional work involved.

d. Inspection of material and finished articles to be incorporated in the work at the site shall be made at the place of production, manufacture, or shipment, whenever the quantity justifies it, unless otherwise stated in the specifications; and such inspection and acceptance in writing, unless otherwise stated in the specifications, shall be final, except as regards latent defects, departures from specific requirements of the contract and the specifications and drawings made a part thereof, damage or loss in transit, fraud, or such gross mistakes as amount to fraud. Subject to the requirements contained in the preceding sentence, the inspection of material and workmanship for final acceptance as a whole or in part, shall be made at the site. Nothing contained in this paragraph d shall in any way restrict the Government's rights under any warranty or guarantee.

ARTICLE 10. Superintendence by Contractor. The Contractor shall give his personal superintendence to the work or have a competent foreman or superintendent, satisfactory to the Contracting Officer, on the work at all times during progress, with authority to act for him.

ARTICLE 11. Permits and Responsibility for Work. The Contractor shall, without additional expense to the Government, obtain all required licenses and permits and be responsible for all damages to persons or property that occur as a result of his fault or negligence in connection with the prosecution of the work, and shall be responsible for all materials delivered and work performed until completion and final acceptance except for any completed unit thereof which may theretofore have been finally accepted.

ARTICLE 12. Other Contracts. The Government may undertake, or award other contracts for additional work, and the Contractor shall fully cooperate with such other contractors and Government employees and carefully fit his own work to such additional work as may be directed by the Contracting Officer. The Contractor shall not commit or permit any act which will interfere with the performance of work by any other contractor or by Government employees.

ARTICLE 13. Additional Security. Should any surety upon any bond that may be required to be furnished in connection with this contract become unacceptable to the Government, or if any such surety shall fail to furnish reports as to his financial condition from time to time as requested by the Government, the Contractor must promptly furnish such additional security as may be required from time to time to protect the interests of the Government or of persons supplying labor or materials in the prosecution of the work contemplated by the contract.

ARTICLE 14. Notice to the Government of Labor Disputes. Whenever the Contractor has knowledge that any factual or potential labor dispute is delaying or threatens to delay the timely performance of this contract, the Contractor shall immediately give notice thereof, including all relevant information with respect thereto, to the Contracting Officer.

ARTICLE 15. Covenant Against Contingent Fees. The Contractor warrants that no person or selling agency has been employed or retained to solicit or secure this contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the Contractor for the purpose of securing business. For breach or violation of this warranty the Government shall have the right to annul this contract without liability or in its discretion to deduct from the contract price or consideration the full amount of such commission, percentage, brokerage, or contingent fee.

ARTICLE 16. Officials Not to Benefit. No member of or delegate to Congress, or resident commissioner, shall be admitted to any share or part of this contract, or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

ARTICLE 17. Assignment of Claims.

a. Pursuant to the provisions of the Assignment of Claims Act of 1940 as amended (31 U. S. Code 203, 41 U. S. Code 15), if this contract provides for payments aggregating \$1,000 or more, claims for moneys due or to become due the Contractor from the Government under this contract may be assigned to a bank, trust company, or other financing institution, including any Federal lending agency,

and may thereafter be further assigned and reassigned to any such institution. Any such assignment or reassignment shall cover all amounts payable under this contract and not already paid, and shall not be made to more than one party, except that any such assignment or reassignment may be made to one party as agent or trustee for two or more parties participating in such financing.

b. In no event shall copies of this contract or of any plans, specifications, or other similar documents relating to work under this contract, if marked "Top Secret", "Secret", "Confidential", or "Restricted", be furnished to any assignee of any claim arising under this contract or to any other person not entitled to receive the same; provided that a copy of any part or all of this contract so marked may be furnished, or any information contained therein may be disclosed, to such assignee upon the prior written authorization of the Contracting Officer.

ARTICLE 18. Patent Indemnity. Except as otherwise specifically provided with respect to any contract items or parts thereof, which are not standard commercial supplies, the Contractor agrees to indemnify the Government and its officers, agents and employees against liability, including costs and expenses, for infringement upon any Letters Patent of the United States (except Letters Patent issued upon an application which is now or may hereafter be, for reasons of national security, ordered by the Government to be kept secret or otherwise withheld from issue) arising out of the performance of this contract or out of the use or disposal by or for the account of the Government of supplies furnished or construction work performed hereunder. The foregoing indemnity shall not apply unless the Contractor shall have been informed as soon as practicable by the Government of the suit or action alleging such infringement, and shall have been given an opportunity to present recommendations as to the defense thereof; and further, such indemnity shall not apply in any one of the following situations:

a. Any infringement resulting from the addition to any such supplies or other supplies not furnished by the Contractor for the purpose of such addition;

b. Any settlement of a claim of infringement made without the consent of the Contractor, unless required by final decree of a court of competent jurisdiction;

c. Any claim of infringement arising from use or disposal outside the scope of any license limitation under which the Contractor is bound, provided that the Contractor has notified the Government of the limitation prior to first delivery under this contract;

d. Any infringement necessarily resulting from changes (other than the substitution of another standard commercial part or component manufactured or supplied by the Contractor) ordered pursuant to this contract, or from specific written instructions given by the Contracting Officer directing a manner of performing the contract not normally utilized by the Contractor.

ARTICLE 19. Notice and Assistance Regarding Patent Infringement.

a. The contractor agrees to report to the Contracting Officer, promptly and in reasonable written detail, each claim of patent infringement based on the performance of this contract and asserted against it, or against any of its subcontractors if it has notice thereof.

b. In the event of litigation against the Government on account of any claim of infringement arising out of the performance of this contract or out of the use of any supplies furnished or construction work performed hereunder, the Contractor agrees that it will furnish to the Government, upon request, all evidence and information in its possession pertaining to the defense of such litigation. Such information shall be furnished at the expense of the Government except in those cases in which the Contractor has agreed to indemnify the Government against the claim being asserted.

ARTICLE 20. Reporting of Royalties. If this contract is in an amount which exceeds \$10,000, the Contractor agrees to report in writing to the Contracting Officer, during the performance of this contract and prior to its completion or final settlement, the amount of any royalties or royalty rates paid or to be paid by it directly to others in connection with the performance of this contract, together with the names and addresses of licensors to whom such payments are made and either the patent numbers involved or such other information as will permit identification of the patents or other basis on which royalties are to be paid. Where the Contractor's compliance with the foregoing reporting requirement is found by the Contracting Officer

to be impracticable because of the size of the Contractor's business or because of the nature of its accounting procedures, the Contractor may furnish one or more reports, based on its established accounting periods and covering the entire contract period, of royalties in excess of \$1,000 (if computed on an annual basis) paid or to be paid to each licensor on the Contractor's over-all business, together with such other information as will permit identification of the patents or other basis on which royalties are to be paid, in which event the Contractor shall furnish the Contracting Officer, upon his request and at Government expense, an allocation of such royalty payments to Government business or to the work or supplies covered by this contract; reference to any such periodic royalty reports, previously furnished to any Government agency and covering the period of performance of this contract, shall constitute compliance with the reporting requirements of this article. If this contract is in an amount which exceeds \$10,000, and no royalties or royalty rates are paid or to be paid directly to others under the circumstances set forth above, the Contractor agrees so to report in writing to the Contracting Officer prior to completion or final settlement of this contract.

ARTICLE 21. Definitions. As used throughout this contract, the following terms shall have the meaning set forth below:

a. The term "Secretary" means the Secretary, the Under Secretary, or any Assistant Secretary of the Department and the head or assistant head of the executive agency; and the term "his duly authorized representative" means any person or persons or board (other than the Contracting Officer) authorized to act for the Secretary.

b. The term "Contracting Officer" means the person executing this contract on behalf of the Government, and any other officer or civilian employee who is a properly designated Contracting Officer; and the term includes, except as otherwise provided in this contract, the authorized representative of a Contracting Officer acting within the limits of his authority.

ARTICLE 22. Approval of Contract. This contract, if it amounts to \$1,000,000 or more, shall be subject to the

not be binding until so approved.

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ARTICLE 23. Alterations in Contract. The following changes were made in this contract before it was signed by the parties hereto:

a. Supplement, entitled "Additional Articles", was attached hereto and made a part of this contract.

b. Contract Articles:

(1) Article 6: In last sentence of this article, delete the phrase "by Sec. 635, Public Law 488, 82d Congress." and substitute "by Sec. 622, Public Law 179, 83d Congress." in lieu thereof.

(2) Article 21: Add the following paragraph "c.":

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(3) Additional Article AA-3: In paragraph "b.", line 6, for the words "this contract with the Government," substitute "the sub-contract,".

(4) Additional Article AA-4:

(a) At end of subdivision "b.(4)", add the following:

"in which case the Government shall have the right, in its discretion, to settle or pay any or all claims arising out of the termination of such orders and subcontracts;"

(b) At end of subdivision "e.(1)(c)", add the following:

"Provided, however, That if it appears that the Contractor would have sustained a loss on the entire contract had it been completed, no profit shall be included or allowed under this subdivision (c) and an appropriate adjustment shall be made reducing the amount of the settlement to reflect the indicated rate of loss."

(5) Article AA-5, RENEGOTIATION, is deleted and the following substituted in lieu thereof:

(a) This contract shall be subject to any act of the Congress, whether heretofore or hereafter enacted and to the extent indicated therein, providing for the renegotiation of said contract and shall be deemed to contain all the provisions required by any such act without subsequent amendment of this contract specifically incorporating such provisions.

(b) The Contractor (which term, as used in this clause, means the party contracting to furnish the materials or perform the work required by this contract) agrees to insert the provisions of this clause, including this paragraph (b), in subcontracts as defined in section 103 (g) of the Renegotiation Act of 1951 (Pub. Law 9, 82nd Cong.), except any subcontracts of a class or type described in section 106 (a) of the Renegotiation Act of 1951.

(c) Nothing contained in this clause shall impose any renegotiation obligation with respect to this contract or any subcontract hereunder which is not imposed by an act of the Congress, heretofore or hereafter enacted."

(6) Additional Article AA-7: In last sentence of paragraph "c.", delete the second word "Contractor", and substitute the word "Government" in lieu thereof.

c. Unit Price Schedule: Unit Price Schedule revised to reflect results of negotiation and contract pricing and inserted after page 5 of the contract.

d. Index: Page I-10 revised to reflect revisions of Sections 20 and 21.

e. Part III - Special Conditions:

(1) Paragraph SC-3e added.

(2) Paragraph SC-18:

(a) Subparagraph b. added for clarification.

(b) Subparagraph c. added to reflect currency of payment.

(3) Paragraphs SC-25 and SC-26 revised for clarification.

f. Part IV - Technical Provisions:

(1) Section 1: Subparagraph 1-04e revised to reflect results of negotiation.

(2) Section 2:

(a) Subparagraph 2-04b, subdivision (2) revised for clarification.

(b) Paragraph 2-16: Sentence added at the beginning of the paragraph to reflect results of negotiation.

(3) Section 8:

(a) Subparagraph 8-05d: First sentence revised to reflect results of negotiation.

(b) Paragraph 8-06: Last sentence added to reflect results of negotiation.

(4) Section 11:

(a) Subparagraph 11-04d First sentence revised to reflect results of negotiation.

(5) Section 16: subparagraph 16-10:

(a) Subparagraph a Hardware schedule HW-1 and HW-2, specifications for Locksets revised to reflect result of negotiation.

(b) Subparagraph b, subdivision (1) lockset specifications revised to reflect results of negotiation.

(5) Section 18:

(a) Paragraph 18-03 First sentence of the paragraph revised to reflect results of negotiation.

(7) Section 20:

(a) Paragraph 20-02 revised to reflect results of negotiation.

(b) Paragraph 20-03 deleted; not applicable.

(c) Paragraph 20-04 revised to reflect results of negotiation.

(8) Section 21: Paragraph 21-03 revised to reflect results of negotiation.

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ADDITIONAL ARTICLES

AA-1 Conflict in Language Translation. The English text of this contract and any modification thereto shall govern in the event of conflict or ambiguity between said English text and any language translation that may be made thereof.

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AA-2 Gratuities.

a. The Government may, by written notice to the Contractor, terminate the right of the Contractor to proceed under this contract if it is found, after notice and hearing, by the Secretary or his duly authorized representative, that gratuities (in the form of entertainment, gifts, or otherwise) were offered or given by the Contractor, or any agent or representative of the Contractor, to any officer or employee of the Government with a view toward securing a contract or securing favorable treatment with respect to the awarding or amending, or the making of any determinations with respect to the performing, of such contract; Provided, that the existence of the facts upon which the Secretary or his duly authorized representative makes such findings shall be in issue and may be reviewed in any competent court.

b. In the event this contract is terminated as provided in paragraph a hereof, the Government shall be entitled:

(1) To pursue the same remedies against the Contractor as it could pursue in the event of a breach of the contract by the Contractor, and

(2) As a penalty in addition to any other damages to which it may be entitled by law, to exemplary damages in an amount (as determined by the Secretary or his duly authorized representative) which shall be not less than three nor more than ten times the costs incurred by the Contractor in providing any such gratuities to any such officer or employee.

c. The rights and remedies of the Government provided in this article shall not be exclusive and are in addition to any other rights and remedies provided by law or under this contract.

AA-01

AA-3. Examination of Records.

a. The Contractor agrees that the Comptroller General of the United States or any of his duly authorized representatives shall, until the expiration of three years after final payment under this contract, have access to and the right to examine any directly pertinent books, documents, papers and records of the Contractor involving transactions related to this contract.

b. The Contractor further agrees to include in all his subcontracts hereunder a provision to the effect that the subcontractor agrees that the Comptroller General of the United States or any of his duly authorized representatives shall, until the expiration of three years after final payment under this contract with the Government, have access to and the right to examine any directly pertinent books, documents, papers, and records of such subcontractor involving transactions related to the subcontract. The term "subcontract" as used in this article excludes:

- (1) Purchase orders not exceeding \$1,000
- (2) Subcontracts or purchase orders for public utility services at rates established for uniform applicability to the general public.

AA-4. Termination for Convenience of the Government.

a. The performance of work under this contract may be terminated by the Government in accordance with this article in whole, or from time to time in part, whenever the Contracting Officer shall determine that such termination is in the best interest of the Government. Any such termination shall be effected by delivery to the Contractor of a Notice of Termination specifying the extent to which performance of work under the contract is terminated, and the date upon which such termination becomes effective.

b. After receipt of a Notice of Termination, and except as otherwise directed by the Contracting Officer, the Contractor shall:

- (1) Stop work under the contract on the date and to the extent specified in the Notice of Termination;

(2) Place no further orders or subcontracts for materials, services, or facilities, except as may be necessary for completion of such portion of the work under the contract as is not terminated;

(3) Terminate all orders and subcontracts to the extent that they relate to the performance of work terminated by the Notice of Termination;

(4) Assign to the Government, in the manner, at the times, and to the extent directed by the Contracting Officer, all of the right, title, and interest of the Contractor under the orders and subcontracts so terminated;

(5) Settle all outstanding liabilities and all claims arising out of such termination of orders and subcontracts, with the approval or ratification of the Contracting Officer to the extent he may require, which approval or ratification shall be final for all the purposes of this article;

(6) Transfer title and deliver to the Government, in the manner, at the times, and to the extent, if any, directed by the Contracting Officer;

(a) The fabricated or unfabricated parts, work in process, completed work, supplies, and other material produced as a part of, or acquired in connection with the performance of the work terminated by the Notice of Termination, and

(b) The completed or partially completed plans, drawings, information, and other property which, if the contract had been completed, would have been required to be furnished to the Government;

(7) Use its best efforts to sell, in the manner, at the times, to the extent, and at the price or prices directed or authorized by the Contracting Officer, any property of the types referred to in provision (6) of this paragraph, Provided, however, that the Contractor,

(a) Shall not be required to extend credit to any purchaser, and

(b) May acquire any such property under the conditions prescribed and at a price or prices approved by the Contracting Officer; and provided further that the proceeds of any such transfer or disposition shall be app-

lied in reduction of any payments to be made by the Government to the Contractor under this contract or shall otherwise be credited to the price or cost of the work covered by this contract or paid in such other manner as the Contracting Officer may direct;

(8) Complete performance of such part of the work as shall not have been terminated by the Notice of Termination; and

25X1C (9) Take such action as may be necessary, or as the Contracting Officer may direct, for the protection and preservation of the property related to this contract which is in the possession of the Contractor and in which the Government has or may acquire an interest. At any time after expiration of the plant clearance period, as defined [REDACTED] as it may be amended from time to time, the Contractor may submit to the Contracting Officer a list, certified as to quantity and quality, of any or all items of termination inventory not previously disposed of, exclusive of items the disposition of which has been directed or authorized by the Contracting Officer, and may request the Government to remove such items or enter into a storage agreement covering them. Not later than fifteen (15) days thereafter, the Government will accept title to such items and remove them or enter into a storage agreement covering the same, provided that the list submitted shall be subject to verification by the Contracting Officer upon removal of the items, or if the items are stored, within forty-five (45) days from the date of submission of the list, and any necessary adjustment to correct the list as submitted shall be made prior to final settlement.

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c. After receipt of a Notice of Termination, the Contractor shall submit to the Contracting Officer its termination claim, in the form and with the certification prescribed by the Contracting Officer. Such claim shall be submitted promptly but in no event later than two years from the effective date of termination, unless one or more extensions in writing are granted by the Contracting Officer upon request of the Contractor made in writing within such two-year period or authorized extension thereof. However, if the Contracting Officer determines that the facts justify such action, he may receive and act upon any such termination claim at any time after such two-year period or extension thereof. Upon failure of the Contractor to submit its termination claim within the time allowed, the

Contracting Officer may determine, on the basis of information available to him, the amount, if any, due to the Contractor by reason of the termination and shall thereupon pay to the Contractor the amount so determined.

d. Subject to the provisions of paragraph c, the Contractor and the Contracting Officer may agree upon the whole or any part of the amount or amounts to be paid to the Contractor by reason of the total or partial termination of work pursuant to this article, which amount or amounts may include a reasonable allowance for profit. The contract shall be amended accordingly, and the contractor shall be paid the agreed amount. Nothing in paragraph e of this article, prescribing the amount to be paid to the Contractor in the event of failure of the Contractor and the Contracting Officer to agree upon the whole amount to be paid to the Contractor by reason of the termination of work pursuant to this article, shall be deemed to limit, restrict or otherwise determine or affect the amount or amounts which may be agreed upon to be paid to the Contractor pursuant to this paragraph d.

e. In the event of the failure of the Contractor and the Contracting Officer to agree as provided in paragraph d upon the whole amount to be paid to the Contractor by reason of the termination of work pursuant to this article, the Contracting Officer shall determine, on the basis of information available to him, the amount, if any, due to the Contractor by reason of the termination and shall pay to the Contractor the amounts determined as follows:

(1) In respect of all contract work performed prior to the effective date of the Notice of Termination, the total (without duplication of any items) of

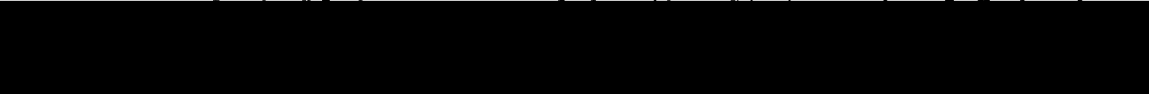
(a) The cost of such work;

(b) The cost of settling and paying claims arising out of the termination of work under subcontracts or orders as provided in paragraph b(5) above, exclusive of the amounts paid or payable on account of supplies or materials delivered or services furnished by the subcontractor prior to the effective date of the Notice of Termination of work under this contract, which amounts shall be included in the cost on account of which payment is made under subdivision (a) above; and

(c) A sum, equal to 2% of the part of the amount determined under subdivision (a) which represents the cost of articles or materials delivered to the site but not incorporated in the work in place on the effective date of the Notice of Termination, plus a sum equal to 8% of the remainder of such amount, but the aggregate of such sums shall not exceed 6% of the whole of the amount determined under subdivision (a) above, which amount for purposes of this subdivision (c) shall exclude any charges for interest on borrowings.

(2) The reasonable cost of the preservation and protection of property incurred pursuant to paragraph b (9) hereof; and any other reasonable cost incidental to termination of work under this contract, including expense incidental to the determination of the amount due to the Contractor as the result of the termination of work under this contract. The total sum to be paid to the Contractor under subdivision (1) of this paragraph e shall not exceed the total contract price as reduced by the amount of payments otherwise made and as further reduced by the contract price of work not terminated. Except for normal spoilage, and except to the extent that the Government shall have otherwise expressly assumed the risk of loss, there shall be excluded from the amounts payable to the Contractor as provided in paragraph e (1), the fair value, as determined by the Contracting Officer, of property which is destroyed, lost, stolen, or damaged so as to become undeliverable to the Government, or to a buyer pursuant to paragraph b (7).

f. Any determination of costs under paragraph c

 as in effect on the date of this contract.

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g. The Contractor shall have the right of appeal, under the article of this contract entitled "Disputes", from any determination made by the Contracting Officer under paragraphs c or e above, except that if the Contractor has failed to submit its claim within the time provided in paragraph c above and has failed to request extension of such time, he shall have no such right of appeal. In any case where the Contracting Officer has made a determination of the amount due under paragraph c or e above, the Government shall pay to the Contractor the following:

(1) If there is no right of appeal hereunder or if no timely appeal has been taken, the amount so determined by the Contracting Officer, or

(2) If an appeal has been taken, the amount finally determined on such appeal.

h. In arriving at the amount due the Contractor under this article there shall be deducted

(1) All unliquidated advance or other unliquidated payments on account theretofore made to the Contractor;

(2) Any claim which the Government may have against the Contractor in connection with this contract, and

(3) The agreed price for, or the proceeds of sale of, any materials, supplies, or other things kept by the Contractor or sold, pursuant to the provisions of this article, and not otherwise recovered by or credited to the Government.

i. If the termination hereunder be partial, prior to the settlement of the terminated portion of this contract, the Contractor may file with the Contracting Officer a request in writing for an equitable adjustment of the price or prices specified in the contract relating to the continued portion of the contract (the portion not terminated by the Notice of Termination), and such equitable adjustment as may be agreed upon shall be made in such price or prices; however, nothing contained herein shall limit the right of the Government and the Contractor to agree upon the amount or amounts to be paid to the Contractor for the completion of the continued portion of the contract when said contract does not contain an established contract price for such continued portion.

j. The Government may from time to time, under such terms and conditions as it may prescribe, make partial payments and payments on account against costs incurred by the Contractor in connection with the terminated portion of this contract whenever in the opinion of the Contracting Officer the aggregate of such payments shall be within the amount to which the Contractor will be entitled hereunder. If the total of such payments is in excess of the amount finally agreed or determined to be due under this article,

such excess shall be payable by the Contractor to the Government upon demand, together with interest computed at the rate of 6% per annum, for the period from the date such excess payment is received by the Contractor to the date on which such excess is repaid to the Government; provided, however, that no interest shall be charged with respect to any such excess payment attributable to a reduction in the Contractor's claim by reason of retention or other disposition of termination inventory until ten days after the date of such retention or disposition.

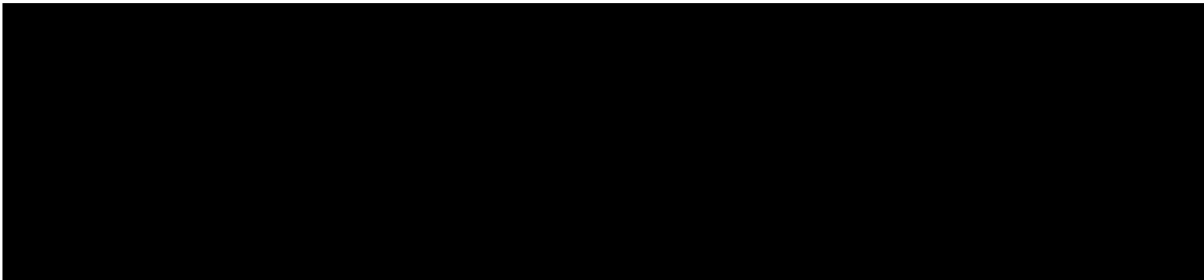
k. Unless otherwise provided for in this contract, or by applicable statute, the Contractor, from the effective date of termination and for a period of six years after final settlement under this contract, shall preserve and make available to the Government at all reasonable times at the office of the Contractor, but without direct charge to the Government, all its books, records, documents, and other evidence bearing on the costs and expenses of the Contractor under this contract and relating to the work terminated hereunder, or, to the extent approved by the Contracting Officer, photographs, micro-photographs, or other authentic reproductions thereof.

AA-5. Renegotiation.

a. This contract is subject to the Renegotiation Act of 1951 (P. L. 9, 82nd Congress) and shall be deemed to contain all the provisions required by Section 104 of said Act.

b. The Contractor (which terms as used in this article means the party contracting to furnish the materials or perform the work required by this contract) agrees to insert the provisions of this clause, including this paragraph b, in all subcontracts as required by Section 104 of the Renegotiation Act of 1951; provided, that the Contractor shall not be required to insert the provisions of this article in any subcontract of a class or type described in Section 106(a) of the Renegotiation Act of 1951.

AA-6. Taxes.



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If any such tax or duty has been included in the contract prices through error or otherwise, the contract prices shall be correspondingly reduced.

b. If for any reason after the contract date, the Contractor is relieved in whole or in part from the payment or the burden of any tax or duty included in the contract prices, the contract prices shall be correspondingly reduced.

*Delete inapplicable words.

AA-7. Government-Furnished Property.

a. The Government shall deliver to the Contractor, for use in connection with and under the terms of this contract, the property which the schedule or the specifications state the Government will furnish (hereinafter referred to as "Government-furnished property"). The completion date of this contract is based upon the expectation that Government-furnished property of a type suitable for use will be delivered to the Contractor at the times stated in the schedule or if not so stated in sufficient time to enable the Contractor to meet such completion date. In the event that Government-furnished property is not delivered to the Contractor by such time or times, the Contracting Officer shall, if requested by the Contractor, make a determination of the delay occasioned the Contractor thereby, and shall grant to the Contractor a reasonable extension of time for completion of performance hereunder. The Government shall not be liable to the Contractor for damages or loss of profit by reason of any delay in delivery of or failure to deliver any or all of the Government-furnished property, except that in case of such delay or failure, upon the written request of the Contractor, an equitable adjustment shall be made in the completion date of this contract, or price, or both, and in any other contractual provision affected thereby, in accordance with the procedures provided for in the article of this contract entitled "Changes".

b. By notice in writing the Contracting Officer may decrease the property furnished or to be furnished by the Government under this contract. In any such case, upon the written request of the Contractor, an equitable adjustment shall be made in the completion date, or price, or both, and in any other contractual provisions affected by such decrease, in accordance with the procedures provided for in the article of this contract entitled "Changes".

c. Title to the Government-furnished property shall remain in the Government. Title to Government-furnished property shall not be affected by the incorporation or attachment thereof to any property not owned by the Government, nor shall such Government-furnished property, or any part thereof, be or become a fixture or lose its identity as personalty by reason of affixation to any realty. The Contractor shall maintain adequate property control records of Government-furnished property in accordance with the provisions of the "Manual for the Control of Government Property in the Possession of Contractors" dated March 1951.

d. The Government-furnished property shall, unless otherwise provided herein, be used only for the performance of this contract.

e. The Contractor shall maintain and administer, in accordance with sound construction practice, a program for the maintenance, repair, protection and preservation of Government-furnished property, until disposed of by the Contractor in accordance with this article. In the event that damaged or defective Government-furnished property is delivered to the Contractor, or any other damage occurs to Government-furnished property the risk of which has been assumed by the Government under this contract, the Government shall replace such items or the Contractor shall make such repair of the property as the Government directs; provided, however, that if the Contractor cannot effect such repair within the time required, the Contractor may reject such property. The contract price includes no compensation to the Contractor for the performance of any repair or replacement for which the Government is responsible, and an equitable adjustment will be made in the contract price for any such repair or replacement of Government-furnished property made at the direction of the Government. Any repair or replacement for which the Contractor is responsible under the provisions of this contract shall be accomplished by the Contractor at his own expense.

f. (1) Except for loss, destruction or damage resulting from a failure of the Contractor, due to willful misconduct or lack of good faith of any of the Contractor's managerial personnel as defined herein, to maintain and administer a program for the maintenance, repair, protection and preservation of the Government-furnished property as required by paragraph e hereof, and except as specifically provided elsewhere in this contract, the Contractor

shall not be liable for loss or destruction of or damage to the Government-furnished property:

(a) Caused by any peril while the property is in transit off the Contractor's premises, or

(b) Caused by any of the following perils while the property is on the Contractor's or subcontractor's premises, or on any other premises where such property may properly be located, or by removal therefrom because of any of the following perils:

1. Fire; lightning, windstorm, cyclones, tornado, hail; explosion; riot, riot attending a strike, civil commotion; vandalism and malicious mischief; sabotage; aircraft or object falling therefrom; vehicles running on land or tracks, excluding vehicles owned or operated by the Contractor or any agent or employee of the Contractor; smoke; sprinkler leakage; earthquake or volcanic eruption; flood, meaning thereby rising of a body of water; hostile or warlike action, including action in hindering, combating, or defending against an actual, impending or expected attack by any government or sovereign power (de jure or de facto), or by any authority using military, naval or air forces, or by an agent of any such government, power, authority, or forces; or

2. Other peril, of a type not listed above, if such other peril is customarily covered by insurance (or by a reserve for self-insurance) in accordance with the normal practice of the Contractor, or the prevailing practice in the industry in which the Contractor is engaged with respect to similar property in the same general locale.

(2) (a) The perils as set forth in (a), and (b) above are hereinafter called "excepted perils".

(b) The term "Contractor's managerial personnel" as used herein means the Contractor's directors, officers and such of its managers, superintendents, or other equivalent representatives who have supervision or direction of:

1. All or substantially all of the Contractor's business;

2. All or substantially all of the Contractor's operation at any one plant or separate

location at which the contract is being performed;

3. A separate and complete major construction, alteration or repair operation in connection with the performance of this contract.

(3) The Contractor represents that it is not including in the price hereunder, and agrees that it will not hereafter include in any price to the Government, any charge or reserve for insurance (including self-insurance funds or reserves) covering loss or destruction of/or damage to the Government-furnished property caused by any excepted peril.

(4) Upon the happening of loss or destruction of or damage to any Government-furnished property caused by an excepted peril, the Contractor shall notify the Contracting Officer thereof, and shall communicate with the [REDACTED] if any, now or hereafter designated by the Contracting Officer, and with the assistance of the [REDACTED] so designated (unless the Contracting Officer has directed that no such organization be employed), shall take all reasonable steps to protect the Government-furnished property from further damage, separate the damaged and undamaged Government-furnished property, put all the Government-furnished property in the best possible order, and furnish to the Contracting Officer a statement of:

(a) The lost, destroyed and damaged Government-furnished property;

(b) The time and origin of the loss, destruction or damage;

(c) All known interests in commingled property of which the Government-furnished property is a part, and

(d) The insurance, if any, covering any part of or interest in such commingled property. The Contractor shall be reimbursed for the expenditures made by it in performing its obligations under this subparagraph (4) (including charges made to the Contractor [REDACTED], except any of such charges the payment of which the Government has, at its option, assumed directly), to the extent approved by the Contracting Officer and set forth in a Supplemental Agreement.

(5) With the approval of the Contracting Officer after loss or destruction of or damage to Government-furnished property, and subject to such conditions and limitations as may be imposed by the Contracting Officer, the Contractor may, in order to minimize the loss to the Government or in order to permit resumption of business or the like, sell for the account of the Government any item of Government-furnished property which has been damaged beyond practicable repair, or which is so commingled or combined with property of others, including the Contractor that separation is impracticable.

(6) Except to the extent of any loss or destruction of/or damage to Government-furnished property for which the Contractor is relieved of liability under the foregoing provisions of this article, and except for reasonable wear and tear or depreciation, or the utilization of the Government-furnished property in accordance with the provisions of this contract, the Government-furnished property (other than property permitted to be sold) shall be returned to the Government in as good condition as when received by the Contractor in connection with this contract, or as repaired under paragraph e above.

(7) In the event the Contractor is reimbursed or compensated for any loss or destruction of or damage to the Government-furnished property, caused by an excepted peril, it shall equitably reimburse the Government. The Contractor shall do nothing to prejudice the Government's rights to recover against third parties for any such loss, destruction or damage and, upon the request of the Contracting Officer, shall at the Government's expense, furnish to the Government all reasonable assistance and cooperation (including the prosecution of suit and the execution of instruments of assignment in favor of the Government) in obtaining recovery.

g. The Government shall at all reasonable times have access to the premises wherein any Government-furnished property is located.

h. Upon the completion of this contract, or at such earlier date as may be fixed by the Contracting Officer, the Contractor shall submit, in a form acceptable to the Contracting Officer, inventory schedules covering all items of Government-furnished property not consumed in the performance of this contract (including any resulting scrap),

or not theretofore delivered to the Government, and shall deliver or make such other disposal of such Government-furnished property, as may be directed or authorized by the Contracting Officer. Recoverable scrap from Government-furnished property shall be reported in accordance with a procedure and in such form as the Contracting Officer may direct. The net proceeds of any such disposal shall be credited to the contract price or shall be paid in such other manner as the Contracting Officer may direct.

1. Directions of the Contracting Officer and communications of the Contractor issued pursuant to this article shall be in writing.

AA-8 Accident Prevention.

a. In order to provide safety controls for protection to the life and health of employees and other persons; for prevention of damage to property, materials, supplies, and equipment; and for avoidance of work interruptions in the performance of this contract; the Contractor will comply with all pertinent provisions of the Manual "Safety Requirements" approved by the [REDACTED] 16 December 1941, as revised 16 April 1951, and as may be further amended, and will also take or cause to be taken such additional measures as the Contracting Officer may determine to be reasonably necessary for the purpose.

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b. The Contractor will maintain an accurate record of, and will report to the Contracting Officer in the manner and on the forms prescribed by the Contracting Officer, exposure data and all accidents resulting in death, traumatic injury, occupational disease, and/or damage to property, materials, supplies and equipment incident to work performed under this contract.

c. The Contracting Officer will notify the Contractor of any non-compliance with the foregoing provisions and the action to be taken. The Contractor shall, after receipt of such notice, immediately correct the conditions. Such notice, when delivered to the Contractor or his representative at the site of the work, shall be deemed sufficient for the purpose. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such stop order shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

d. Compliance with the provisions of this article by subcontractors will be the responsibility of the Contractor.

SPECIFICATIONS

FOR

CONSTRUCTION OF

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DUPLEX DWELLINGS,

-2 FAMILY DWELLINGS

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PART I

STATEMENT OF WORK

SW-1 DESCRIPTION OF WORK:

a. Work to be Done: The work consists of furnishing all supervision, plant, labor, materials, equipment, supplies, transportation, including fuel, power and water (except any materials, equipment, utilities or services, if any, specified herein to be furnished by the Government)

25X1A

[REDACTED]
with all required appurtenant work, complete, in strict accordance with the specifications, schedules, drawings, and conditions all of which are made a part hereof and designated as follows:

25X1A

[REDACTED]
(Drawings are designated in Paragraph SC-2 of the specifications)

b. Location: The site of the work contemplated under these specifications is located at [REDACTED]

25X1A

SW-2 PRINCIPAL FEATURES: The project includes the following principal features:

a. Construction of [REDACTED] Dwellings, of reinforced-concrete framing, floor and roof slab, and concrete-block walls, each approximately 1,900 square feet in floor area, including concrete patio, concrete platform, utilities to 5 feet outside the building line and necessary grading in the vicinity of the building. 25X1A

b. Construction of [REDACTED] Dwellings, of reinforced concrete framing, floor slab and precast roof slab, and concrete-block walls, each approximately 1,470 square feet in floor area, including utilities to 5 feet outside the building line and necessary grading in the vicinity of the building 25X1A

c. Overall grading (except building sites)

d. Construction of concrete sidewalks and garbage stands.

e. Installation of water lines, sanitary sewers and electrical lines.

f. Installation fuel oil storage tank and piping.

25X1C

g. Removal and disposal of existing [REDACTED] buildings.

The foregoing general outline of principal features does not in any way limit the responsibility of the Contractor to perform the work and furnish all supervision, plant, labor, materials, equipment, supplies, transportation, including fuel, power and water, except any materials, equipment, utilities or services, if any, specified herein to be furnished by the Government, required by the specifications, and the plans and drawings referred to therein.

PART II

GENERAL CONDITIONS

GC-1 Scope of Work. The work to be performed under this contract consists of furnishing all plant, materials, equipment, supplies, labor and transportation, including fuel, power, water (except any materials, equipment, utility or service, if any, specified herein to be furnished by the Government), and performing all work as required by Article I of the contract, in strict accordance with the specifications, schedules, and drawings, all of which are made a part hereof, and including such detail drawings as may be furnished by the Contracting Officer from time to time during the prosecution of the work in explanation of said drawings.

GC-2 Character of Work and Mechanics. The work shall be executed in the best and most workmanlike manner by qualified, careful and efficient mechanics in strict accordance with the drawings and specifications.

GC-3 Site Investigation and Representations. The Contractor acknowledges that he has satisfied himself as to the nature and location of the work, the general and local conditions, particularly those bearing upon transportation, disposal, handling and storage of materials, availability of labor, water, electric power, roads, and uncertainties of weather, river stages, tides or similar physical conditions at the site, the conformation and conditions of the ground, the character of equipment and facilities needed preliminary to and during the prosecution of the work and all other matters upon which information is reasonably obtainable and which can in any way affect the work or the cost thereof under this contract. The Contractor further acknowledges that he has satisfied himself as to the character, quality and quantity of surface and sub-surface materials to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by the Government, as well as from information presented by the drawings and specifications made a part of this contract. Any failure by the Contractor to acquaint himself with all the available information will not relieve him from responsibility for estimating properly the difficulty or cost of successfully performing the work. The Government assumes no responsibility for any understanding or representations made by any of its officers or agents during or prior to the execution of this contract, unless (1) such understanding or representations are expressly stated in the contract and (2) the contract expressly provides that the responsibility therefor is assumed by the Government. Representations made but not so expressly stated and for which liability is not expressly assumed by the Government in the contract shall be deemed only for the information of the Contractor.

GC-01

GC-4 Operations and Storage Areas.

a. All operations of the Contractor (including storage of materials) upon Government premises shall be confined to areas authorized or approved by the Contracting Officer. No unauthorized or unwarranted entry upon or passage through, or storage or disposal of materials shall be made upon Government premises. Government premises adjacent to the construction will be made available for use by the Contractor without cost whenever such use will not interfere with other Government uses or purposes. The Contractor shall be liable for any and all damage caused by him to such Government premises. The Contractor shall hold and save the Government, its officers and agents, free and harmless from liability of any nature or kind arising from any use, trespass or damage occasioned by his operations on premises of third persons.

b. Temporary buildings (storage sheds, shops, offices, etc.) may be erected by the Contractor only with the approval of the Contracting Officer, and shall be built with labor and materials furnished by the Contractor without expense to the Government, except as may otherwise be provided under the "Government-Furnished Property" Special Condition of these specifications. Such temporary buildings and/or utilities, to the extent that the Contractor shall have furnished the materials therefore, shall remain the property of the Contractor, and will be removed by him at his expense upon completion of the work. With the written consent of the Contracting Officer, such buildings and/or utilities may be abandoned and need not be removed.

c. The Contractor shall, under regulations prescribed by the Contracting Officer, use only established roadways or construct and use such temporary roadways as may be authorized by the Contracting Officer. Where materials are transported in the prosecution of the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any federal, state, or local law or regulation. When it is necessary to cross curbs or sidewalks, protection against damage shall be provided by the Contractor and any damaged roads, curbs, or sidewalks shall be repaired by, or at the expense of the Contractor.

GC-5 Identification of Contractor's Employees.

a. The Contractor without expense to the Government shall provide for each of his employees, working on this contract, an identification badge suitable to the Contracting Officer. Each such employee shall be required to wear his badge upon his person at all times while on duty at the site of work or at other times and places where identification is required, and in such manner that it will be plainly visible as a means of identification. If required by the Contracting Officer, the Contractor shall obtain fingerprints and other means of identification for all such employees.

b. In the event the Government desires registration of all employees working on this project, the Contractor shall cause them to be registered at such place and in such manner as the Contracting Officer may direct. Upon notification that registration is to be effected, the Contractor shall not permit any employee to work on the job site until such employee has completed the required registration.

GC-6 Progress Charts, and Requirements for Overtime Work.

a. The Contractor shall within five (5) days or within such time as determined by the Contracting Officer, after date of commencement of work, prepare and submit to the Contracting Officer for approval a practicable schedule, showing the order in which the Contractor proposes to carry on the work, the date on which he will start the several salient features (including procurement of materials, plant and equipment) and the contemplated dates for completing the same. The schedule shall be in the form of a progress chart of suitable scale to indicate appropriately the percentage of work scheduled for completion at any time. The Contractor shall enter on the chart the actual progress at the end of each week or at such intervals as directed by the Contracting Officer, and shall immediately deliver to the Contracting Officer three copies thereof.

b. The Contractor shall furnish sufficient forces, construction plant and equipment, and shall work such hours, including night shifts and overtime operations, as may be necessary to insure the prosecution of the work in accordance with the approved progress schedule. If, in the opinion of the Contracting Officer, the Contractor falls behind the progress schedule, the Contractor shall take such steps as may be necessary to improve his progress and the Contracting Officer may require him to increase the number of shifts, and/or overtime operations, days of work, and/or the amount of construction plant, all without additional cost to the Government.

c. Failure of the Contractor to comply with the requirements of the Contracting Officer under the provision shall be grounds for determination by the Contracting Officer that the Contractor is not prosecuting the work with such diligence as will insure completion within the time specified. Upon such determination the Contracting Officer may terminate the Contractor's right to proceed with the work, or any separable part thereof, in accordance with the "Termination for Default-Damages for Delay-Time Extensions" article of the contract.

GC-7 Subcontractors. Only competent and responsible subcontractors shall be employed on the work. The Contractor shall notify the Contracting Officer in writing of the names of all subcontractors proposed for the work, together with the extent, character, and scope of the work to be done by each subcontractor. No subcontract shall be entered into by the Contractor or any subcontractor until the subcontractor

and the scope of work covered by the subcontract have been approved in writing by the Contracting Officer. The Contractor shall, within seven (7) days after the making of any subcontract, deliver to the Contracting Officer an affidavit setting forth the name and address of the subcontractor and a summary description of the precise work subcontracted. If for sufficient reason, at any time during the progress of the work, the Contracting Officer determines that any subcontractor is incompetent or undesirable, he will notify the Contractor accordingly and immediate steps will be taken by the Contractor for the cancellation of such subcontract. Subletting by subcontractors shall be subject to the same regulations. Nothing contained in this contract shall create any contractual relation between the subcontractor and the Government.

GC-8 Samples and Descriptive Data.

a. Any samples and descriptive data required shall:

- (1) Be submitted within the time specified in these specifications or, if no time be specified, within a reasonable time before use to permit inspection and testing.
- (2) Be shipped prepaid and delivered as specified in these specifications, or as directed by the Contracting Officer.
- (3) Be properly marked to show the name of the material, trade name of manufacturer, place of origin, name and location of the work where the material represented by the sample is to be used, and the name of the Contractor submitting the sample.

b. Samples not subjected to destructive tests may be retained until completion of the work but thereafter will be returned to the Contractor, if he so requests in writing, at his own expense. Failure of any sample to pass the specified requirements will be sufficient cause for refusal to consider further any samples from the same manufacturer whose materials failed to pass the tests.

GC-9 Protection of Material and Work. The Contractor shall at all times protect and preserve all materials, supplies and equipment of every description (including property which may be Government-furnished or owned) and all work performed. All reasonable requests of the Contracting Officer to inclose or specially protect such property shall be complied with. If, as determined by the Contracting Officer, material, equipment, supplies and work performed are not adequately protected by the Contractor such property may be protected by the Government and the cost thereof may be charged to the Contractor or deducted from any payments due to him.

GC-10 Preservation of Existing Vegetation.

a. The Contractor will preserve and protect all existing vegetation such as trees, shrubs, and grass on or adjacent to the site which do not unreasonably interfere with the construction as may be determined by the Contracting Officer. The Contractor will be responsible for all unauthorized cutting or damaging of trees and shrubs, including damage due to careless operation of equipment, stock piling of materials or tracking of grass areas by equipment.

b. Care will be taken by the Contractor in felling trees authorized for removal to avoid any unnecessary damage to vegetation that is to remain in place. Any limbs or branches of trees broken during such operations, shall be trimmed with a clean cut and painted with an approved tree pruning compound if required by the Contracting Officer. The Contractor will be liable for or may be required to replace or restore at his own expense all vegetation not protected and preserved as required herein that may be destroyed or damaged.

GC-11 Possession Prior to Completion. The Government shall have the right to take possession of or use any completed or partially completed part of the work. Such possession or use shall not be deemed an acceptance of any work not completed in accordance with the contract. If such prior possession or use by the Government delays the progress of the work or causes additional expenses to the Contractor, an equitable adjustment in the contract price and/or the time of completion will be made and the contract shall be modified in writing accordingly.

GC-12 Suspension of Work. The Contracting Officer may order the Contractor to suspend all or any part of the work for such period of time as may be determined by him to be necessary or desirable for the convenience of the Government. Unless such suspension unreasonably delays the progress of the work and causes additional expense or loss to the Contractor, no increase in contract price will be allowed. In the case of suspension of all or any part of the work for an unreasonable length of time causing additional expense or loss, not due to the fault or negligence of the Contractor, the Contracting Officer shall make an equitable adjustment in the contract price and modify the contract accordingly. An equitable extension of time for the completion of the work in the event of any such suspension will be allowed the Contractor; provided, however, that the suspension was not due to the fault or negligence of the Contractor. Provided, further, that no suspension will be ordered or adjustments made under this paragraph for delays arising as the result of changes ordered or as the result of changed conditions encountered under the respective articles relating to Changes and Changed Conditions or as the result of any delays for which an extension of time may be granted under the "Termination for Default-Damages for Delay-Time Extensions Article" of this contract.

GC-13 Labor Reports. The Contractor shall maintain and shall cause all subcontractors to maintain in like manner true and correct payrolls for all employees, indicating the names and classifications of, the hours worked, and the amounts earned less any lawful deductions during the period covered by such payrolls. Each employee will sign the payroll and at least one duplicate copy thereof at the time of receipt by him of the amount stated in the payroll as due him for such payroll period. The Contractor shall promptly furnish, and shall cause any subcontractors to furnish in like manner, within seven (7) days after the regular payment date of each payroll, to the Contracting Officer one of above-mentioned duplicate payrolls duly signed by the employee concerned, and certified as true and correct by the Contractor or the subcontractor, as applicable. Original payrolls and all supporting documents shall be kept and maintained in the manner provided for books and records in the SC-22, "Records and Accounts", of the contract. The Contractor shall also prepare and furnish and shall cause all subcontractors to prepare and furnish in like manner all labor reports as may be required by applicable law or regulation by the Contracting Officer.

GC-14 Cleaning Up. The Contractor shall at all times keep the construction area, including storage areas used by him, free from accumulations of waste material or rubbish and prior to completion of the work remove any rubbish from and about the premises and all tools, scaffolding, equipment, and materials not the property of the Government. Upon completion of the construction the Contractor shall leave the work and premises in a clean, neat and workmanlike condition satisfactory to the Contracting Officer.

GC-15 Definitions. Wherever in the specifications or upon the drawings the words directed, required, ordered, designated, prescribed, or words of like import are used, it shall be understood that the direction, requirement, permission, order, designation, or prescription of the Contracting Officer is intended and similarly the words approved, acceptable, satisfactory, or words of like import shall mean approved by, or acceptable to, or satisfactory to the Contracting Officer, unless otherwise expressly stated.

PART III

SPECIAL CONDITIONS

SC-1 COMMENCEMENT, PROSECUTION AND COMPLETION: The Contractor will be required to commence work under this contract within fifteen (15) calendar days after the date of receipt by it of written notice to proceed, to prosecute said work with faithfulness and energy, and to complete the first dwelling (any type) with utilities ready for use within two hundred (200) calendar days after the date of receipt of written notice to proceed and one (1) dwelling (any type) with utilities every five (5) calendar days thereafter. The times of completion for each dwelling (any type) shall include final clean-up of the premises.

SC-2 CONTRACT DRAWINGS, MAPS AND SPECIFICATIONS: Eight (8) sets of contract drawings, maps and specifications will be furnished to the Contractor without charge. Additional sets will be furnished on request at the cost of reproduction. The work shall conform to the following drawings all of which form a part of these specifications and

25X1C

<u>Drawing No.</u>	<u>Sheet No.</u>	<u>Description</u>
25-19-46	(A1)	1 Arch Floor Plan, Elevations and Schedule
	(A2)	2 Sections and Details
	(A3)	3 Door and Window Details
	(A4)	4 Kitchen and Bathroom Details
	(S1)	5 Struct Foundation and Roof Framing Plan & Details
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	(E1)	7 Elect Lighting Layout

25X1A

25-19-47	(A1)	1 Arch Plan, Elevations, Sections & Schedule
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	(A5)	5 Window Details
	(S1)	6 Struct Foundation Plan, Sections and End Wall Details
	(S2)	7 Roof Framing Plan and Sections
	(S3)	8 Porch Roof Slab Details
	(S4)	9 Pre-Cast Conc. Roof Slab Details
	(M1)	10 Mech Heating and Ventilating Plan
	(M2)	11 Plumbing Plan
	(E1)	12 Elect Layout & Details

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SC-01

16-06-210	1	Civil	Site Plan
71-08-145	1	Civil	Layout & Utilities Plan
71-03-113	1	Elect	Electrical Distribution
71-02-02	1	Mech	Fuel System & Details

STANDARD DRAWINGS

49-05-01	1.8	Standard Street Section and Details
40-06-01	1.10	Typical Transformer Station - Enclosed Type - Structural Details
	4.3	Standard Lighting Fixture Details
	5.6	Standard Lighting Fixture Details
	7.2	Detail of 5.0 KV Overhead Electrical Construction
	11.11	Standard Details of Underground Electrical Construction
	27	Standard Lighting Fixture
40-07-01	1.5	Standard Water Distribution System
40-08-01	1.7	Standard Sewer Details

SC-3 GOVERNMENT-FURNISHED PROPERTY:

a. The Government will furnish, without charge, to the Contractor the materials listed in Appendix A, to be incorporated in the work.

b. No materials, as distinguished from equipment, except those referred to in subparagraph "a". above, will be furnished by the Government without charge to the Contractor.

c. Government-furnished materials will be furnished to the Contractor at [REDACTED] as designated by the Contracting Officer. The Contractor will accept delivery of materials when and where made, and will load, transport, unload and store said materials, all at its own expense.

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d. No Government-owned construction equipment and vehicles will be furnished, without charge, to the Contractor for use in the performance of the work under this contract. However, Government-owned construction equipment and vehicles may be made available to the Contractor

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[REDACTED]

1953. The character, amounts of and charges for such equipment and vehicles which may be made available, may be obtained from the Contracting Officer.

SC-02

c. Title to the 10 quonset huts now on the project site shall vest in the Contractor immediately upon the execution of this contract. The Government will not be responsible for the condition of or any loss or damage to such property from any cause whatsoever. All property acquired by the Contractor hereunder shall be removed from the site by the Contractor promptly as the storage of such property on the site will not be permitted beyond the completion date hereof. In the event the Contractor does not wish to remove from the site any part of the property he has acquired hereunder, the Contracting Officer upon a written request may grant the Contractor permission to leave such property on the premises. The Contractor agrees as a condition of the granting of such permission to waive any right, title or interest in and to such property. If the Contractor's right to proceed is terminated under Article 5 of this contract, title to property vested in the Contractor hereunder shall immediately revert in the Government notwithstanding any other provision of this contract, except as to such property as the Contractor has disposed of by bonafide sale or property which Contractor has removed from the site.

SC-3A CONTRACTOR-FURNISHED PROPERTY:

a. The Contractor will furnish all the materials necessary to complete the work under this contract, except the Government-furnished materials listed in Appendix A.

b. The Contractor will furnish all the construction equipment and vehicles of the character and in the amount necessary to complete the work under this contract within the specified time.

c. The Contractor will furnish the lumber for plant facilities and materials required for the construction of temporary buildings.

SC-3B CONTRACTOR'S CAMP SITE: The Contractor shall be responsible to arrange with the landowners for the location of its camp, shall pay all charges involved, and shall bear all expense of developing its camp site. The Government will not be responsible in any manner for furnishing such camp site.

SC-3C GUARANTY: All Contractor-furnished equipment and/or materials to be incorporated in the work shall be guaranteed for a period of ninety (90) days from the date of acceptance of the structure, against defective materials, design and workmanship. Upon receipt of notice from the Government of failure of any part of the guaranteed equipment and/or materials during the guaranty period, the affected part or parts shall be replaced promptly with new parts by and at the expense of the Contractor.

25X1A SC-4 Water. The Contractor shall be responsible for providing and maintaining at his own expense an adequate supply of water for his use for domestic and construction consumption in the [REDACTED] 25X1A
[REDACTED] Provided, however, That subject to the approval of the Contracting Officer, if water is available in excess of the needs of the Government, all reasonable required amounts of water will be made available to the Contractor by the Government from existing water system outlets and supplies, without cost to the Contractor for the water he consumes; Provided, further, That the Contractor shall furnish, install and maintain all necessary supply connections and piping for same at his own expense, but only at such locations and in such manner as may be approved by the Contracting Officer. All water shall be carefully conserved. Before final acceptance of work under this contract, all connections and piping installed by the Contractor at all locations shall be removed by the Contractor at his own expense in a manner satisfactory to the Contracting Officer.

25X1A SC-5 Electricity. The Contractor shall be responsible for providing and maintaining at his own expense an adequate supply of electric current for his use for domestic and construction consumption in the [REDACTED] Provided, however, That subject to the approval of the Contracting Officer, if electric current is available in excess of the needs of the Government, all reasonably required amounts of electric current will be made available to the Contractor by the Government from existing distribution lines without cost to the Contractor for the electric current it consumes; Provided, further, That the Contractor shall furnish, install and maintain all necessary connections and wiring for same at his own expense, but only at such locations and in such manner as may be approved by the Contracting Officer. Electric current shall be carefully conserved. Before final acceptance of work under this contract, all connections and wiring installed by the Contractor at all locations shall be removed by the Contractor at his own expense in a manner satisfactory to the Contracting Officer.

SC-6 Labor and Rates of Wages.

a. The Contractor shall not employ any person who is

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approval of the Contracting Officer.

25X1A b. All common and semiskilled labor will be recruited from within the geographical limits [REDACTED] In importing labor to the location where the work is being performed in the [REDACTED] the Contractor shall be responsible for compliance with all applicable medical, security, immigration, labor and other laws and regulations of: The Government; the military 25X1C

SC-05

government concerned; the government exercising jurisdiction where the work is being performed; and/or the government of the place of origin.

c. Wage and hour and other laws and regulations, when applicable, pertaining to the employment of labor prescribed by: The Government; the military government concerned; the government exercising jurisdiction where the work is being performed; and/or the government of the place of origin, shall be observed by the Contractor for the duration of this contract. The wage and hour and

[REDACTED]

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to be applicable under this contract shall be submitted by the Contractor to the Contracting Officer within thirty (30) days after the receipt of Notice to Proceed.

SC-7 Bonds. No payment or performance bond will be required.

SC-8 Communications Services. Telephone service on [REDACTED] may be obtained, as available, by the Contractor upon application, in writing, to the Contracting Officer. Installation costs and the prevailing monthly rental service charges will be borne by the Contractor. Other communications services required by the Contractor shall be obtained at his own expense.

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SC-9 Inoculations, Medical and Dental Services. Prior to their departure from any port of embarkation, the Contractor, without cost to the Government, shall cause his employees to submit to inoculations and vaccinations for smallpox, typhoid-paratyphoid, typhus and tetanus, in addition to those others as may be required by applicable law or regulation or by any governmental authority exercising jurisdiction thereover. The Contractor, at his own expense, shall make available to his employees adequate and sanitary first-aid, dispensary and hospital facilities, and shall, at his own expense, be responsible for the evacuation of those employees who may require treatment not available in the [REDACTED]. If available and if requested by the Contractor, the Government may, at its discretion, furnish to the Con-

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[REDACTED]
established rates prescribed by the Government. Only emergency dental care will be offered by the Government at established rates prescribed by the Government. All such medical and dental facilities and services furnished will be at the Contractor's expense.

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SC-10 Fuels, Lubricants and Spare Parts. All fuels, lubricants and spare parts required by the Contractor shall be furnished at his own expense. Contractors having U. S. dollar credits may procure fuels and lubricants on [REDACTED] through the facilities of the [REDACTED] until commercial facilities become available. After commercial

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facilities are established, [REDACTED] will not be available. The Contractor will be required to accept delivery at the commercial outlet or at the issue point designated by the Contracting Officer, load, haul, unload, store, dispense and otherwise utilize these products at his own expense. Payment for fuels and lubricants acquired from the Quartermaster will be made at prevailing rates monthly by the Contractor by direct payment to the Government.

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SC-11 Construction Materials. Materials, if any, to be furnished by the Contractor may be purchased [REDACTED] through the facilities of the Contracting Officer, if excess to the needs of the [REDACTED]. The Contractor may determine the availability of such materials for purchase by submission of an inquiry, in writing, to the Contracting Officer. All materials thus purchased will be accepted by the Contractor at the issue point designated by the Contracting Officer, loaded, hauled, unloaded, stored, and transported--all at his own expense. Payment for materials thus purchased will be made to the Government at prevailing rates.

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SC-12 [REDACTED] Recreational Facilities.

[REDACTED] recreational facilities in the [REDACTED] are limited and their availability is subject to variable local regulations governing their operation. The Contractor will investigate and determine the availability of these facilities for use by himself and his employees. If the Contractor determines that existing facilities are not available, or are inadequate for his employees, additional such facilities may be provided by the Contractor without cost to the Government, subject to approval by the Contracting Officer, and to such other limitations as may be imposed by local regulations governing their operation. Nothing herein contained will be construed as a guarantee by the Government of the availability at any time or to any extent of these facilities. The Government assumes no responsibility for financial losses or for any inconvenience sustained by the Contractor as a direct or indirect result of the non-availability of such facilities.

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SC-13 Contractor's Camp.

a. The Contractor will, at his own expense, provide living and feeding accommodations for his employees and necessary temporary warehouses, shops, office space, etc., which he may require for the prosecution of the work. Materials required for the construction of these necessary facilities for the prosecution of the work in the [REDACTED] covered by this contract may be purchased in accordance with the provisions of the "CONSTRUCTION MATERIALS" special condition of these specifications.

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b. It shall be the responsibility of the Contractor to provide at his own expense all supplies necessary for the feeding of his employees. Standard [REDACTED], if available, may be purchased by contractors having U. S. dollar credits from the Government on a [REDACTED] basis. The Contractor will be permitted to purchase only one [REDACTED] per person per day. The Contractor will accept delivery and assume all responsibility at the designated point of issue for food purchased from the Government. Payment for food thus purchased will be made at prevailing rates plus 10 percent for handling and service charges monthly by the Contractor by direct payment to the Government. The Contractor shall be responsible, without additional cost to the Government, for operation, security, supervision, maintenance and repair of Contractor's camp facilities. Operation and maintenance of Contractor's camp and facilities will conform to regulations prescribed by the Contracting Officer. The Contractor and his employees, regardless of country of origin, will be subject to discipline under [REDACTED] law for all violations of local, civil [REDACTED] statutes and regulations. [REDACTED] jurisdiction of the United States.

SC-14 Shop Drawings. The Contractor shall submit to the Contracting Officer for approval six (6) copies of all shop drawings as called for under the various headings of these specifications. These drawings shall be complete and shall contain all required detailed information. If approved by the Contracting Officer, each copy of the drawings will be identified as having received such approval by being so stamped and dated. The Contractor shall make any corrections required by the Contracting Officer. Five (5) sets of all shop drawings will be retained by the Contracting Officer and one (1) set will be returned to the Contractor. The approval of the drawings by the Contracting Officer shall not be construed as a completed check but will indicate only that the general method of construction and detailing is satisfactory. Approval of such drawings will not relieve the Contractor of the responsibility for any error which may exist as the Contractor shall be responsible for the dimensions and design of adequate connections, details and satisfactory construction of all work.

SC-15 Physical Data. Information and data furnished or referred to below are not intended as representations or warranties but are furnished for information only. It is expressly understood that the Government will not be responsible for the accuracy thereof or for any deductions, interpretations or conclusions drawn therefrom.

a. Weather: Data on air temperature in degrees F, humidity, rainfall, wind and storms, compiled by [REDACTED] over a period of 30 unspecified years follows:

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- (4) Winds: The average strength of winds throughout the year ranges from gentle to moderate with wind velocities of 38 miles per hour or more recorded every month. The number of days with wind of gale strength (33 mph) averages 8.4 per year.

(a) Mean wind directions in percentage of time:

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	<u>Annual</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>
N	19	30	29	25	15	13	4
NE	21	30	24	21	15	16	5
E	15	12	13	13	17	19	9
SE	13	9	9	13	16	14	13
S	12	6	6	12	17	16	33
SW	7	2	3	5	7	8	25
W	3	1	2	2	3	4	4
NW	6	8	12	7	6	6	3
Calm	4	2	2	2	4	4	4
		<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
N		6	8	17	24	26	29
NE		6	9	19	35	43	38
E		13	19	18	17	15	13
SE		22	18	16	8	6	7
S		24	11	7	3	2	3
SW		15	11	4	2	1	1
W		4	8	4	2	1	1
NW		4	9	8	5	4	6
Calm		6	7	7	4	2	2

(b) Prevailing wind direction and velocity in miles per hour:

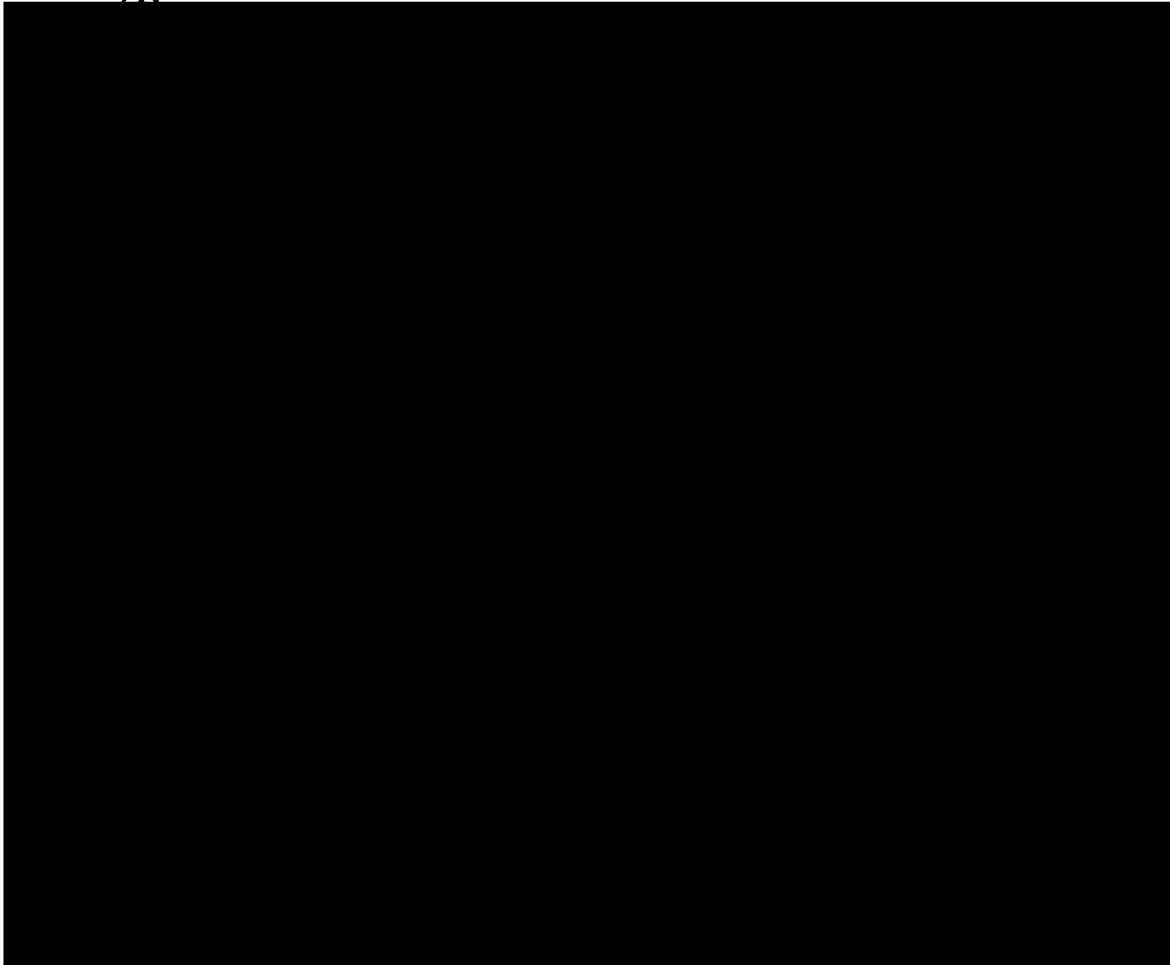
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	<u>Annual</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>
Mean direction	ENE	NE	NNE	NE	E	E	S
Mean velocity	8	10	10	8	7	6	6
		<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
Mean direction		SSE	ESE	ENE	NE	NE	NE
Mean velocity		6	7	8	8	10	10

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The site of the work to be performed under this contract is specifically located under "DESCRIPTION OF WORK" paragraph of Part I, STATEMENT OF WORK of these specifications.

SC-16 Protection of Existing Structures, Utilities and Work.
The Contractor shall protect all existing structures and work of any kind as well as all existing utilities, that are either shown on the drawings or the locations of which are made known to the Contractor prior to any operation, against damage or interruption of service which may result from his operations. Damage or interruption of service resulting from failure so to do shall be repaired or restored promptly by or at the expense of the Contractor. In the event that any utility, the location of which has not been made known to the Contractor in sufficient time to avoid damage thereto, or interruption of service thereof, is damaged, or service interrupted, due to his operations, the utility shall be repaired and/or service restored by the Contractor as directed by the Contracting Officer. Such repairs and/or interruption of service shall be paid for by the Government at rates determined and approved by the Contracting Officer.

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SC-17 Inspection. The work will be conducted under the general direction of the Contracting Officer and is subject to inspection by his appointed inspectors to insure strict compliance with the terms of the contract. Inspectors will direct maintenance of gauges, ranges, location marks and limit marks in proper order and position. No inspector is authorized to change any provision of the specifications without written authorization of the Contracting Officer, nor will the presence or absence of an inspector relieve the Contractor from any requirements of the contract.

SC-18 Payments.

a. Payments will be made as provided in the "PAYMENTS TO CONTRACTOR" article of the contract. Unless otherwise authorized in writing by the Contracting Officer, the items of work for which payment will be made shall be limited to those listed and enumerated in the contract. The unit price or lump sum price or prices stated in the contract will be used in determining the amount to be paid and shall constitute full and final compensation for all the work.

b. The Contracting Officer, in preparing estimates for partial payments (see Article 7 of the contract) may at his discretion take into consideration up to seventy-five (75) percent of the value of all Contractor-furnished materials when said materials are delivered to the project site; Provided, That said materials are received in acceptable condition to be incorporated in the work and are supported by proper invoices.

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SC-19 Estimated Quantities. Quantities listed in the schedule of unit prices, if any, "STATEMENT OF WORK" article of the contract, or in Part I, STATEMENT OF WORK, of the specifications, or in any appendices to the contract, are estimates only. The Contractor will be required to complete the work specified in the contract and the specifications thereto in accordance with the contract and at the contract price or prices whether it involves quantities greater or less than those listed.

SC-20 Layout of Work. The Contractor shall lay out the work from a base line and from a bench mark established by the Government. The Contractor shall furnish without cost to the Government all stakes, templates, platforms, ranges, equipment, tools and materials, and all labor required in setting or cutting or laying out the work, including measurements and computations, and shall be responsible for the proper execution of the work to the Government established line and grade as shown on the drawings specified in the attached Technical Provisions or fixed by the Contracting Officer at the project site. All stakes and other marks established by the Government shall be preserved by the Contractor until their removal is authorized by the Contracting Officer.

SC-21 Transportation of Contractor Personnel and Materials.

a. Personnel: Transportation of Contractor's employees from the point of hire and/or origin to [REDACTED] and/or to the project site and return to the point of hire and/or origin will be entirely the responsibility of the Contractor, and at the expense of the Contractor. The Government may, at its discretion and upon receipt of written request from the Contractor, provide transportation for Contractor's employees at established Government or transportation contract rates, payable by the Contractor. However, the Government assumes no responsibility for financial losses or delays sustained by the Contractor as a direct or indirect result of the transportation provided by the Government, nor will any extension of contract time be allowed incident to such losses or delays.

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b. Materials: Transportation to [REDACTED] and/or to the project site of Contractor's materials, supplies and equipment will be entirely the responsibility of the Contractor, and at the expense of the Contractor. The Government may, at its discretion and upon receipt of written request from the Contractor, provide transportation on Government vessels on a space available basis for Contractor's materials, supplies and equipment at established Government rates payable by the Contractor. The Government will not become an insurer of Contractor's materials, supplies and equipment for which it provides transportation, nor will the Government in any way relieve the Contractor of the responsibility for transportation of these items as stated above in this paragraph. Also, the Government will assume

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no responsibility for financial losses sustained by the Contractor due to delays which might be encountered in furnishing transportation, nor will any extension of time of completion of the project be granted for such delays.

SC-22 Records and Accounts. The system of accounting to be employed by the Contractor will be such as to be satisfactory to the Contracting Officer. Books and records pertaining to the contract shall be kept and maintained in the English language, to the extent and at such place or places as the Contracting Officer may direct, and the Government, at all reasonable times, shall have the right and be given the opportunity to inspect and audit the books and records of both the Contractor and all Subcontractors under this contract; and a provision confirming and agreeing to such right of the Government with reference to subcontracts shall be incorporated as a part of the agreement of the parties in all subcontracts.

SC-23 Accident Prevention, Fire-Prevention and Sanitation. In addition to full compliance with the article of the contract entitled "ACCIDENT PREVENTION", the Contractor will comply with all pertinent

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comply with the following provisions:

a. Prior to commencement of work the Contractor will:

(1) Submit in writing, to the Contracting Officer its proposals for effectuating the above provisions.

(2) Meet in conference with representative of the Contracting Officer to discuss and develop mutual understanding relative to administration of the overall safety program.

b. During the performance of the work under this contract the Contractor shall comply with all procedures prescribed by the Contracting Officer for the control and safety of persons visiting the job site. If at any time during the performance of the work under this contract, the total number of persons employed by the Contractor and its Subcontractors in connection therewith shall equal or exceed five hundred (500), it shall then become the responsibility of the Contractor to provide a full-time qualified Safety Engineer who shall have the duty and the authority to secure compliance by the Contractor, its Subcontractors and employees with the "ACCIDENT PREVENTION" article of the contract and with the terms of this special condition.

c. It shall be the responsibility of the Contractor to provide and maintain warning signs, lights, signal devices and barricades appropriately located on the construction site to give proper and understandable warning to all persons of the dangers of entry onto the land, structures or equipment involved under the contract.

d. It shall be the responsibility of the Contractor to comply with all regulations pertaining to sanitation as may be prescribed by the Contracting Officer. The Contractor will be required to provide water borne disposal of sewage waste in areas where reasonable access to a sanitary sewer outfall is available. In areas where reasonable access to a sanitary sewer outfall is not available, the Contractor may erect and utilize pit latrines in accordance with the sanitary regulations prescribed by the Contracting Officer. Wet and dry garbage shall be stored in closed containers provided by the Contractor and disposed of in accordance with regulations prescribed by the Contracting Officer, or as may be otherwise required by applicable law or regulation.

e. Compliance with the provisions of the special condition by subcontractors will be the responsibility of the Contractor.

SC-24 QUALITY OF ARTICLES, MATERIALS AND EQUIPMENT:

a. Articles, Materials and equipment to be incorporated into the work under this contract shall be new and unused unless otherwise specified.

b. Unless otherwise specified or indicated, materials and equipment shall conform to the requirements of the specifications or standards, as listed in "INDEX OF SPECIFICATIONS AND STANDARD" used by the [REDACTED] and shall also conform to the revisions and amendments thereto in effect on the date of issue of the Invitation for Quotations.

c. All equipment and hardware furnished under this contract for installation in the work shall be approved by the Contracting Officer or his authorized representative. Where the Technical Provisions provide for approved American products, an equivalent product acceptable to the Contracting Officer may be substituted therefor. Only the standard product of an approved American manufacturer or approved equivalent shall be acceptable. Where two or more units of the same class of equipment are required, these units shall be products of a single manufacturer; however, the component parts of the system need not be the products of the same manufacturer. The product of any reputable American manufacturer regularly engaged in the commercial production of any equipment, proposed to be furnished by the Contractor, will not be excluded on the basis of minor differences, provided all essential requirements of the specifications relative to materials, capacity and performance are met. The Contractor shall furnish a statement giving a complete description of all points wherein the equipment it proposes to furnish does not comply with the specifications, as well as any exceptions it may take to the specification. Failure to furnish such a statement will be interpreted that the Contractor agrees to meet all requirements of the specifications.

d. No American-manufactured products or parts thereof assembled outside of the United States will be acceptable. All containers of products or parts shall be delivered to the site with labels intact and seals unbroken. Containers shall not be opened until inspected by the Contracting Officer.

SC-25 LIQUIDATED DAMAGES: In case of failure on the part of the Contractor to complete the work within the time fixed in the contract or any extensions thereof, the Contractor shall pay the Government as liquidated damages for each dwelling with its appurtenant utilities (including all items in the Unit Price Schedule necessary to make each dwelling complete and usable) the sum of \$10.00 for each calendar day of delay until it is complete and ready for use or accepted.

SC-26 WITHHOLDING OF FUNDS TO ASSURE WAGE PAYMENT: In the event it is brought to the attention of the Contracting Officer that the Contractor or any subcontractor has failed to pay the full amount of wages due his employees, the Contracting Officer may take any or all of the following actions:

a. Withhold from the Contractor and/or any assignee of claims for moneys due or to become due the Contractor and/or assignee from the Government under the contract (Notwithstanding the provisions of the assignment of claims article) amounts representing such non-payments of wages.

b. Suspend the contract work until the Contractor furnishes evidence to the satisfaction of the Contracting Officer that all labor payments owing by the Contractor and any subcontractors will be settled and future obligations paid as they become due.

c. After written notice to the Contractor affording him an opportunity to correct the condition, and such correction has not occurred, (1) declare the Contractor in default and terminate his right to proceed with the work or such part of the work as to which there has been a failure to pay said wages and (2) prosecute the work to completion by contract or otherwise, whereupon such Contractor and his sureties shall be liable to the Government for any excess cost occasioned the Government thereby as well as for liquidated damages as provided in the contract.

PART IV -- TECHNICAL PROVISIONS

SECTION 1

EXCAVATION, FILLING AND BACKFILLING FOR
BUILDING CONSTRUCTION

1-01 SCOPE: The work covered by this section of the specifications consists in furnishing all plant, labor, equipment, appliances, and materials not furnished by the Government, and in performing all operations in connection with the excavation, filling and backfilling for building construction and for utilities systems occurring within the enclosing walls or appurtenances of buildings and to a line 5 feet beyond, complete, in strict accordance with this section of the specifications and the applicable drawings, and subject to the terms and conditions of the contract.

1-02 APPLICABLE STANDARD: The following standard, of the issue listed below but referred to thereafter by basic designation only, forms a part of this specification:

American Association of State Highway Officials Standard Method:
T 99-49. Standard Laboratory Method of Test For the Compaction
and Density of Soil.

1-03 CLASSIFICATION OF EXCAVATION: Excavation shall be performed on an unclassified basis, in which case no consideration will be given to the nature of the materials. Unclassified excavation shall comprise and include the satisfactory removal and disposition of all materials excavated regardless of the nature of the materials encountered, and which shall, therefore, be understood to include both rock and common excavation when both classes are present. Neither the conditions of the material at the time it is excavated nor the manner in which it is excavated will have any bearing on, nor will be given any consideration in classification of excavation. Excavation for buildings, including bracing or sheeting, filling and backfilling, and all operations in connection thereto, will be considered as a subsidiary obligation of the Contractor, and shall be covered under the contract price of the building involved.

1-04 EXCAVATION:

a. General: The site indicated on the drawings shall be cleared of natural obstructions and existing foundations, pavements, utility lines, and other items that would interfere with the construction operations. The excavation shall conform to the dimensions and elevations indicated on the drawings for each building and structure, except as specified below, and shall include trenching for utility systems to a point 5 feet beyond the building line of each building and structure, and all incidental work thereto. In conditions where suitable bearings are encountered at different elevations from those indicated on the drawings, the Contracting Officer may direct in writing that the excavation be carried to elevations above or below those indicated on the drawings. Unless so directed by the

Contracting Officer, excavation shall not be carried below the elevations indicated on the drawings. Where the excavation is made below the elevations indicated on the drawings or directed by the Contracting Officer, the excavation, if under slabs, shall be restored to the proper elevation in accordance with the procedure hereinafter specified for filling, or if under footings, the excess depth shall be filled with concrete. Excavation shall extend a sufficient distance from walls and footings to allow for placing and removal of forms, installation of services, and for inspection, except where the concrete for walls and footings is authorized to be deposited directly against excavated surfaces. Undersutting will not be permitted. Topsoil, and suitable excavated material required for fill under slabs, shall be separately stockpiled as directed by the Contracting Officer.

b. Drainage in vicinity of buildings and other structures:

The Contractor shall control the grading in the vicinity of buildings and other structures so that the surface of the ground will be properly sloped to prevent water from running into the excavated areas. Any water that accumulates in the excavation shall be removed promptly.

c. Shoring, including sheet piling, where required during excavation, shall be installed to protect workmen and the banks, adjacent paving, structures, and utilities.

d. Excess material from excavation, not required for fill or backfill, shall be wasted, spread and leveled or graded, as directed by the Contracting Officer.

e. Vegetation and topsoil in the area shall be dug out and left in the vicinity of the area where directed by the Contracting Officer. Topsoil shall be removed to a depth of 4 inches from the area within lines 25 feet outside the foundation walls and shall be piled where directed by the Contracting Officer. Contractor shall remove vegetation and existing shrubs in a manner acceptable to the Contracting Officer so that they can be salvaged and replanted at a later date. No landscaping nor replanting of shrubs will be done by the Contractor.

f. Removal of Utilities: When utility lines are encountered within the area of operations, the contractor shall notify the Contracting Officer in ample time for the necessary measures to be taken to prevent interruption of the service.

g. Blasting: The Contracting Officer shall be the judge as to the necessity for the use of explosives. When rock excavation requires blasting, the Contractor shall exercise care not to overshoot, and shall be required to remove, at its own expense, any material outside the authorized cross-section which may be shattered or loosened by such blasting.

1-05 FILLING: Where concrete slabs are to be placed on earth, loam and organic or other material determined undesirable by the Contracting Officer shall be removed. Fill, where required to raise the subgrade for concrete slabs to the elevations indicated on the drawings or required by the Contracting Officer, shall consist of broken stone, sand, gravel, or other approved material. Fill shall be compacted by a power roller or other approved equipment, and the subgrade brought to a reasonably true

and even plane. Broken stone, sand, or gravel used for fill shall be placed in layers not more than 12 inches thick. Earth used for fill shall be placed in layers not more than 8 inches thick. Each layer shall be uniformly spread, moistened as required, and then compacted to 95 percent of maximum density obtained at the optimum moisture content as determined by the A.A.S.H.O. Standard Method T 99 with the following modifications:

(1) The mold shall be 6 inches in diameter and 7 inches high. A metal spacer disk 5-15/16 inches in diameter and 2 1/8 inches high shall be used as a false bottom in the mold during compaction.

(2) In lieu of removing all material retained on a No. 4 sieve, all material over three-quarters of an inch in size shall be removed and replaced with an equal portion of material between 0.18 inch (No. 4 sieve) and three-quarters of an inch in size.

(3) The weight of the rammer or metal tamper shall be 10 pounds instead of 5.5 pounds, and the tamper shall be dropped from a height of 18 inches instead of 12 inches.

(4) The samples shall be compacted in five layers, each approximately one inch thick, and each layer shall receive 55 blows with the specified tamper.

(5) A separate batch of soil shall be used for each compaction test specimen. No material shall be reused.

1-06 BACKFILLING: After completion of foundation footings and walls, piling, and other construction below the elevation of the final grades, and prior to backfilling, forms shall be removed and the excavation shall be cleaned of trash and debris. Backfill shall consist of the excavation, or borrow of sand, gravel, or other approved materials, and shall be free of trash, lumber, or other debris. Backfill shall be placed in horizontal layers not more than 9 inches thick, and shall have a proper moisture content for the required degree of compaction. Each layer shall be compacted by hand or machine tampers or by other suitable equipment to a density that will prevent excessive settlement or shrinkage. Backfill under concrete floor slabs shall be compacted to the density specified hereinbefore for filling. Backfill shall be brought to a suitable elevation above grade to provide for anticipated settlement and shrinkage thereof.

1-07 GRADING: The Contractor shall perform all necessary grading and compaction to prepare each dwelling site to established grade shown on the drawings or as directed by the Contracting Officer. The grading includes the transportation, hauling, placing and rolling of the pads required for each family dwelling. All costs in connection therewith shall be included in the contract unit price of each family dwelling.

(FOR BUILDING CONSTRUCTION)

2-01 SCOPE: The work covered by this section of the specifications consists in furnishing all plant, labor, equipment, appliances, and materials not furnished by the Government and in performing all operations in connection with the installation of concrete work, complete, in strict accordance with this section of the specifications and the applicable drawings, and subject to the terms and conditions of the contract.

2-02 APPLICABLE SPECIFICATIONS: The following specifications, standards, and publications, of the issues listed below but referred to thereafter by basic designation only, form a part of this specification:

a. Federal Specifications:

P-O-361-	Oil, Floor; Mineral.
HH-F-191a	Felt; Asphalt-Saturated (for) Flashings, Roofing, and Waterproofing.
HH-F-341a	Filler, Expansion-Joint, Preformed; Non-extruding and Resilient-Types (for Concrete).
QQ-B-71a	Bars; Reinforcement (for) Concrete.
QQ-B-101c	Bases, Metal; (for) Plaster and Stucco Construction.
SS-A-281a	Aggregate; (for) Portland-Cement-Concrete.
SS-C-192a	Cements, Portland.
SS-S-164	Sealer; Hot-Poured Type (for Joints in Concrete).
TT-C-598	Compound, Calking; Plastic (for Masonry and Other Structures).
TT-W-572	Wood-Preservative; Water-Repellent.
TT-P-264a	Paper, Concrete-Curing, Waterproofed (Kraft).
LLL-F-311	Fiber-Board; Hard-Pressed, Structural.

b. American Society for Testing Materials Standards:

- | | |
|-----------|---|
| A 82-34 | Cold-Drawn Steel Wire for Concrete Reinforcement. |
| A 185-37 | Welded Steel Wire Fabric for Concrete Reinforcement. |
| A 305-50T | Minimum Requirements for the Deformations of Deformed Steel Bars for Concrete Reinforcement. |
| C 31-49 | Making and Curing Concrete Compression and Flexure Test Specimens in the Field. |
| C 39-49 | Compressive Strength of Molded Concrete Cylinders. |
| C 40-48 | Organic Impurities in Sands for Concrete. |
| C 42-49 | Securing, Preparing, and Testing Specimens from Hardened Concrete for Compressive and Flexural Strengths. |
| C 192-52T | Making and Curing Concrete Compression and Flexure Test Specimens in the Laboratory. |

c. American Concrete Institute Publications:

- | | |
|------------|---|
| ACI 315-51 | Manual of Standard Practice for Detailing Reinforced Concrete Structures. |
| ACI 318-51 | Building Code Requirements for Reinforced Concrete. |
| ACI 613-44 | Recommended Practice for the Design of Concrete Mixes. |

2-03 GENERAL: Full cooperation shall be given other trades to install embedded items. Suitable templates or instructions, or both, will be provided for setting items not placed in the forms. Embedded items shall have been inspected, and tests for concrete and other materials or for mechanical operations shall have been completed and approved, before concrete is placed.

2-04 MATERIALS:

a. Abrasives: Abrasive aggregate shall be aluminum oxide or emery graded from particles retained on a No. 50 sieve to particles passing a No. 8 sieve.

b. Aggregate: Both coarse and fine aggregate, except for gradation, limit of absorption, and sources of materials, shall conform to the requirements of Federal Specification SS-A-281a. Limit of absorption shall not exceed 5%.

(1) General: Coarse and fine aggregate shall consist of crushed limestone and screenings, or other approved granular materials of similar characteristics, and shall be composed of hard, tough, durable and uncoated particles. The equipment and plant used in the production of coarse and fine aggregate shall be designed for the aggregate conforming with the requirements of these specifications. Dust shall be removed by adequate washing. The particle shape of the smallest size of crushed coarse and fine aggregate shall be generally rounded or cubical, and the tolerance of flat and elongated particles in all sizes of the coarse and fine aggregate shall be governed by the inherent placeability requirements of the structure in which the mixture is to be placed. Rock which breaks down into thin, flat, elongated particles, regardless of the type of processing equipment used, will not be approved for use in the production of coarse and fine aggregate. A thin, flat and elongated particle is defined as a particle having a maximum dimension greater than five (5) times the minimum dimension. Aggregate shall not be manufactured from rock which is subject to weathering or disintegration when exposed to air or moisture nor from rock containing opaline or other reactive mineral.

(2) Coarse and Fine Aggregate: Coarse (type I and/or V) and fine (Type II) aggregate shall be well graded from fine to coarse and shall be within the grading limits shown in the following table. The maximum size of coarse aggregate shall be one inch for Class AA and Class A concrete and 1-1/2 inches for Class B concrete.

TABLE OF GRADING LIMITS

Screen Sizes (Inches)	Percent by Weight Passing			
	Type I	Type II	Type IIP*	Type V
2	100			
1 1/2	95-100			
1	20-55			100
3/4	0-15			95-100
1/2				
3/8	0-5	100		20-55
No. 4		95-100		0-15
No. 8		65-90	100	0-5
No. 16		45-70	95-100	
No. 30		25-45	40-70	
No. 50		10-20	25-40	
No. 100		2-8	0-25	
No. 200	0-2	0-4	0-5	0-2

* Type III aggregates are for Mortar, Plaster & Shotcrete.

Concrete. Only one brand of cement shall be used for the exposed concrete in any individual structure. Cement reclaimed from cleaning bags or leaking containers shall not be used. Cement shall be used in the sequence of shipments received, unless otherwise directed by the Contracting Officer. Portland cement shall conform to the requirements of Federal Specification SS-C-192a, Type I.

d. Anchorage Items: Slots and inserts for anchoring masonry and mechanical items to concrete, shall be of standard manufacture, of types required to engage with the anchors to be provided and installed therein under other sections of these specifications, and shall be subject to the approval of the Contracting Officer.

6. Curing materials:

(1) Waterproof paper: Federal Specification UU-P-264.

(2) Burlap: Commercial quality.

(3) Membrane curing compounds: [REDACTED]

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f. Drainage fill under concrete floor slabs and areaways shall be porous, free-draining material such as broken stone, gravel, or cinders.

g. Expansion joints:

(1) Premolded expansion-joint filler strips: Federal Specification HH-F-341, sizes indicated on the drawings.

(2) Joint sealer, hot-poured type: Federal Specification SS-S-164, and shall be delivered to the building site in manufacturer's sealed containers.

(3) Joint compound, gun-type: Federal Specification TT-C-598, grade I.

h. Forms shall be of wood, metal, or other approved material and shall conform to the following requirements:

(1) Wood forms:

(a) Unexposed concrete surfaces: No. 2 Common or better lumber.

(b) Exposed concrete surfaces: Dressed-and-matched boards of uniform thickness, and width not exceeding 10 inches.

(c) Rubbed or smooth surfaces: Plywood or with linings as specified below.

(2) Plywood: Commercial-Standard Douglas-fir, moisture-resistant, concrete-form plywood, not less than 5-ply and at least 9/16-inch thick.

(3) Metal forms of approved type that will produce surface equal to those specified for wood forms.

(4) Hardboard forms: A hardpressed fiberboard conforming to Federal Specification LLL-F-311, especially treated for concrete-form use, not less than 1/4 inch thick.

(5) Form lining:

(a) Plywood: Commercial-Standard Douglas-fir, concrete-form exterior, 3-ply, not less than 1/4 inch thick.

(b) Fiberboard: treated hard-pressed fiberboard, having a low degree of water absorptivity, not less than 3/16 inch thick, with one smooth side.

(c) Absorptive-type lining: Material having an absorption coefficient sufficient to eliminate voids and pitting and to produce a dense and uniform concrete surface; not liable to discolor, nor interfere with the normal chemical reaction of, the cement; easily cut for fitting; and readily removable at end of curing period.

(6) Form oil: Federal Specification P-O-361, except that when used on hardboard forms the viscosity shall be not less than 250 seconds at 100° F.

(7) Form sealer: Federal Specification TT-W-572.

(8) Form ties shall be of approved design, fixed or adjustable in length, free of devices which will leave a hole larger than 7/8 inch in diameter in surface of concrete, and when used where discoloration of the concrete would be objectionable, metal remaining after removal of external parts shall be not less than one inch from the finished surface.

i. Reinforcement:

(1) Bars: Federal Specification QQ-B-71, type B, grade 2, 3, 4, or 5, except as otherwise noted on the drawings. Deformations shall conform to [REDACTED]

(2) Mesh reinforcement: [REDACTED], when indicated in slabs on fill, if any, mesh shall be of the sizes indicated.

j. Water shall be clean, fresh, and free from injurious amounts of mineral and organic substances.

2-05 SAMPLES AND TESTING:

a. General: Testing of the aggregate, reinforcement, cement and end items shall be the responsibility of the Government. The testing agency shall be approved. Samples of concrete for strength tests of end items shall be provided and stored by the Contractor when and as directed.

b. Cement shall be tested as prescribed in Federal Specification SS-C-192, under cement shall be sampled either at the mill or at the site of the work. Tests will be made by or under the supervision of the Contracting Officer, at the expense of the Government. No cement shall be used until notice has been given by the Contracting Officer that the test results are satisfactory. Cement which has been stored, other than in the bins at the mills, for more than 4 months after being tested shall be retested before use. Ordinarily, no cement shall be used until it has satisfactorily passed both the 7- and 28-day tests; but in cases of urgency the Contracting Officer may waive the 28-day tests and permit the use of cement which has satisfactorily passed the chemical, soundness, and 7-day tests, provided it is the product of a quarry and mill which have established a reputation of not less than 3 years' standing for the production of high-grade cement. Any cement delivered at the site of the work and later found under test to be unsuitable shall be removed from the work and its vicinity.

c. Aggregate shall be tested as prescribed in Federal Specification SS-A-281. In addition, fine aggregate shall be tested for organic impurities in conformance with [REDACTED]

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d. Reinforcement: Reinforcing bars shall be tested as prescribed in Federal Specification QQ-B-71. Mesh reinforcement shall be tested as prescribed in [REDACTED]

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e. Concrete (except lightweight):

(1) Strength tests during the work: The Contractor shall provide for test purposes one set of three cylinders taken from each 250 cubic yards or fraction thereof, or each day's pour, whichever is less, of each class of concrete placed. Test specimens shall be made and cured under laboratory conditions. Cylinders shall be tested in accordance with [REDACTED]. The test result shall be the average of the strengths of the three cylinders, except that if one specimen in a test shows manifest evidence of improper sampling, molding, or testing, the test result shall be the average of the remaining two specimens. If two specimens show such defects, the test shall be discarded. The standard age of test shall be 28 days, but 7-day tests may be used, with the permission of the Contracting Officer, provided that the relation between the 7-day and 28-day strengths of the concrete is established by tests for the materials and proportion used. If the average of the strength tests of the laboratory control specimens for any portion of the work falls below the minimum allowable compressive strength at 28 days required for the class of concrete used in that portion, the Contracting Officer shall have the right to order a change in the proportions or the water content of the concrete, or both, for the remaining portions of the work at the Contractor's expense. If the average strength of the specimens cured on the job falls below the minimum allowable strength, the Contracting Officer may require changes in the conditions of temperature and moisture necessary to secure the required strength.

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(2) Tests of hardened concrete in, or removed from, the structures where there is doubt as to the concrete in the structure, the Contracting Officer may require tests in accordance with

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or order load tests for that portion of the structures where the questionable concrete has been placed. When required, the load tests shall be made, at the Contractor's expense, in accordance with section 202 of the [REDACTED]. In the event that load tests indicate that concrete placed does not conform to the drawings and these specifications, measures as prescribed by the Contracting Officer shall be taken to correct the deficiency at no additional expense to the Government.

2-06 STORAGE: Storage accommodations shall be subject to approval and shall afford easy access for inspection and identification of each shipment in accordance with test reports.

a. Cement: Immediately upon receipt at site of work, cement shall be stored in a dry, weathertight, properly ventilated structure, with adequate provision for prevention of absorption of moisture.

b. Aggregate: Storage piles of aggregate shall afford good drainage, preclude inclusion of foreign matter, and preserve the gradation. Sufficient live storage shall be maintained to permit segregation of successive shipments, placement of concrete at required rate, and such procedures as heating, inspection, and testing.

2-07 FORMS: Complete with centering, cores, and molds, shall be constructed to conform to shape, form, line, and grade required, and shall be maintained sufficiently rigid to prevent deformation under load. Where hardboard forms are used, studs shall be spaced sufficiently close to prevent deflection of hardboard and consequent waviness in surface of concrete.

a. Design: Joints shall be leakproof and shall be arranged vertically or horizontally to conform to the pattern of the design. Forms placed on successive units for continuous surfaces shall be fitted to accurate alinement to assure a smooth completed surface free from irregularities. In long spans, where intermediate supports are not possible, the anticipated deflection in the forms due to weight of fresh concrete shall be accurately figured and taken into account in the design of the forms, so that finished concrete members will have true surfaces conforming accurately to desired lines, planes, and elevations. If adequate foundation for shores cannot be secured, trussed supports shall be provided. Temporary openings shall be arranged in wall and column forms and where otherwise required, to facilitate cleaning and inspection. Lumber once used in forms shall have nails withdrawn and surfaces to be exposed to concrete carefully cleaned before reuse. Forms shall be readily removable without hammering or prying against the concrete.

b. Form ties shall be of suitable design and adequate strength for the purpose. Wire ties will not be permitted where discoloration of the finished surface would be objectionable. Bolts and rods which are to be completely withdrawn shall be coated with grease.

c. Joints: Corners of columns, girders, and beams and other exposed joints in more than one plane unless otherwise indicated on the drawings or directed, shall be beveled, rounded, or chamfered by moldings placed in the forms.

d. Coating: Forms for exposed surfaces, except those with absorptive lining, shall be coated with oil before reinforcement is placed. Surplus oil on form surfaces and any oil on reinforcing steel shall be removed. Forms for surfaces not exposed to view or normal weathering may be thoroughly wet with water in lieu of oiling immediately before placing of concrete. Wood forms for concrete that is to be painted shall be coated with sealer instead of with oil or water.

e. Removal: Forms shall be removed only with approval of the Contracting Officer and in a manner to insure complete safety of the structure. Where the structure as a whole is supported on shores, the beam and girder sides, columns, and similar vertical forms may be removed after 24 hours, provided concrete is sufficiently hard not to be injured thereby. In no case shall supporting forms or shoring be removed until members have acquired the strength specified in subparagraph "(1)" below. Care shall be taken to avoid spalling the concrete surface. Wood forms shall be completely removed from under porches, steps, and similar spaces through temporary openings if necessary.

(1) Control tests: Results of suitable control tests will be used as evidence that concrete has attained sufficient strength to permit removal of supporting forms. Cylinders required for control tests shall be provided in addition to those otherwise required by this specification. Test specimens shall be removed from molds at end of 24 hours and stored in the structure as near points of sampling as possible, shall receive insofar as practicable the same protection from the elements during curing as is given those portions of the structure which they represent, and shall not be removed from the structure for transmittal to the laboratory prior to expiration of three-fourths of the proposed period before removal of forms. In general, supporting forms or shoring shall not be removed until strength of control-test specimens has attained a value of at least 1,500 pounds for columns and 2,000 pounds for all other work. Care must be exercised to assure that the newly unsupported portions of the structure are not subjected to heavy construction or material loading.

(2) Clamps: Tie-rod clamps to be entirely removed from the wall shall be loosened 24 hours after concrete is placed, and form ties, except for a sufficient number to hold forms in place, may be removed at that time. Ties wholly withdrawn from wall shall be pulled toward inside face.

(3) Filling tie-rod or bolt holes: Holes left by bolts or tie rods shall be filled solid with cement mortar. Mortar passing entirely through wall shall be filled from inside face with a device that will force the mortar through to outside face, using a stop head at the outside wall surface to insure complete filling. Holes which do not pass entirely through walls shall be packed full. Excess mortar at face of filled holes shall be struck off flush.

2-08 REINFORCING STEEL: Fabricated to shapes and dimensions shown, shall be placed where indicated on drawings or required to carry out intent of drawings and specifications. Before being placed, reinforcement shall be thoroughly cleaned of rust, mill scale, or coating, that would reduce or destroy the bond. Reinforcement reduced in section shall not be used. Following any substantial delay in the work, previously placed reinforcement left for future bonding shall be inspected and cleaned. Reinforcement shall not be bent or straightened in a manner injurious to the material. Bars with kinks or bends not shown on drawings shall not be placed. The heating of reinforcement for bending or straightening will be permitted only if entire operation is approved by the Contracting Officer. In slabs, beams, and girders, reinforcement shall not be spliced at points of maximum stress. Laps or splices shall be of adequate length to transmit stresses and, unless otherwise indicated, shall conform to the table in ACI 315. Splices in adjacent bars shall be staggered. Splices in columns, piers, and struts shall be lapped sufficiently to transfer the full stress by bond.

25X1C a. Design: Unless otherwise indicated on the drawings, the details of reinforcing steel shall conform to the [REDACTED]. Except as otherwise shown on the drawings or specified, construction shall conform to the following requirements:

(1) Concrete covering over steel reinforcement shall be not less than the following thicknesses:

Footings and other principal structural members in which concrete is deposited against the ground. - - - - - 3 inches between steel and ground.

Where concrete surfaces, after removal of forms, are exposed to weather or ground: - - - - -

For bars more than 5/8 inch in diameter- 2 inches.

For bars 5/8 inch or less in diameter- - 1½ inches.

Where surfaces are not directly exposed to weather or ground: - - - - -

For slabs and walls - - - - - 3/4 inch.

For beams, girders, and ties columns - - 1½ inches.

All covering - - - - - Equal to diameter of round bars and 1½ times side dimension of square bars.

Exposed reinforcement bars intended for bonding with future extensions shall be protected from corrosion by concrete or other adequate covering.

(2) Steel in walls and lintel beams, unless otherwise shown, shall be continuous throughout the length of the various members. Splices shall not occur at critical sections.

(3) Stirrup spacer bars: All stirrups, except ties, shall be held in place by two 3/8-inch spacer bars extending the full length of that portion of the beam or girder occupied by stirrups.

(4) Outside bars of slab reinforcement, both main and temperature, parallel to beams, girders, or walls, shall be placed not over one-half bar spacing from the adjacent face of each member.

(5) Wire-mesh reinforcement, when used in slabs, shall be supported at proper elevations by standard accessories. In slabs on ground, precast concrete blocks may be substituted for chairs.

(6) Shop drawings: Shop detail and placing drawings for all reinforcing steel shall be furnished for approval.

b. Supports: With the exception of temperature reinforcement which shall be tied to main steel approximately 24 inches on centers, reinforcement shall be accurately placed and securely tied at all intersections and splices with 18-gage black annealed wire, and shall be securely held in position during the placing of concrete by spacers, chairs, or other approved supports. Wire-tie ends shall point away from the form. Unless otherwise indicated on the drawings or specified, the number, type, and spacing of supports shall conform to the [REDACTED]

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(1) For slabs on grade (over earth or over drainage fill) and for footing reinforcement: Bars or mesh shall be supported on precast concrete blocks, spaced at intervals required by size of reinforcement used, to keep reinforcement the minimum height specified above the under side of slab or footing.

2-09 CLASSES OF CONCRETE AND USAGE:

a. Strength requirements: Concrete of the various classes required shall be proportioned and mixed for the following strengths:

Class of concrete	Minimum allowable compressive strength at 28 days*
	Pounds per square inch
AA - - - - -	3000
A - - - - -	2500
B - - - - -	2000

*Concrete made with high-early-strength cement shall have a 7-day strength equal to the specified 28-day strength for concrete of the class specified made with ordinary portland cement.

b. Usage: Concrete of the various classes shall be used as follows:

(1) Class A concrete: For precast roof slab and for such other reinforced work as noted on the drawings.

(2) Class A concrete: For all reinforced work not otherwise shown on the drawings or specified.

(3) Class B concrete: For all concrete not reinforced except as otherwise shown on the drawings or specified.

2-10 PROPORTIONING OF CONCRETE MIXES: Concrete shall be proportioned by weight.

a. Measurements:

(1) Cement: A one-cubic-foot bag of portland cement, when will be considered as 94 pounds in weight.

(2) Water: One gallon of water will be considered as 8.33 pounds.

(3) Aggregate: Coarse aggregate shall be used in the greatest amount consistent with required workability, and shall be of the largest size suitable for the work and economically available. Grade A aggregate as described in Federal Specification SS-A-281 shall be used for concrete for exterior exposure and foundation walls in contact with earth, and grade B aggregate may be used in other concrete unless otherwise noted on the drawings or directed.

b. Corrective additions to remedy deficiencies in aggregate gradations shall be used only with the written approval of the Contracting Officer. When such additions are permitted, the material shall be measured separately for each batch of concrete.

c. Control: The design of the concrete mixture, to meet strength requirements of the class or classes of concrete specified, shall be the responsibility of the Contracting Officer. In designing the mix, aggregate proposed for use by the contractor and approved by the Contracting Officer will be used. The design mix will be determined well in advance of commencement of the work so as to cause no delay.*

(1) Mix design: Before placing any concrete, adequate quantities of the concrete ingredients proposed for use shall be supplied to the Contracting Officer for making trial design mixes. In case of change in source or character of concrete ingredients after concrete placing has started, sufficient quantities of ingredients, including the new material, shall be furnished the Contracting Officer for determining a new mix. No substitutions shall be made in the materials used in the work without approval of the Contracting Officer. Average cement content will be as follows:

*There will be no additional compensation for changing the proportions of the mix to overcome field and aggregate deficiencies or to obtain the specified qualities and characteristics of the concrete.

Class of concrete	Average cement content, bags per cubic yard
AA (3000 p. s. i.) - - - - -	5.5
A (2500 p. s. i.) - - - - -	5.0
B (2000 p. s. i.) - - - - -	4.5

(2) Slump test: Consistency will be determined by the slump test. The slump shall fall within the following limits:

Type of structure	Slump for vibrated concrete,* inches	
	Minimum	Maximum
General building construction - - - -	2	3
Thin reinforced walls - - - - -	3	4

*When placing of concrete without vibration is approved, slump shall be from 3 to 6 inches.

(3) Mix proportions: Preliminary mix proportions will be furnished the contractor by the Contracting Officer before start of operations. Adjustments will be made by the Contracting Officer, as required, to determine final proportions which will best satisfy job requirements and use of materials. Subsequent adjustment in these final mix proportions will be made by the Contracting Officer as required to compensate for variations in the gradation and moisture content of the aggregates. Necessary revisions in water-cement ratio and concrete mix proportions shall be made as directed.

(4) Workability: The consistency of the mixture will be that required for the specific conditions and methods of placement. The slump shall not exceed that specified above.

(5) Strength tests: The Contracting Officer will determine the strength of the concrete in the completed work during the progress of construction by test specimens made, cured, and tested as specified herein under SAMPLES AND TESTING. Modifications of the design mix, if required, will be made by the Contracting Officer on the basis of the strength of these test specimens.

2-11 JOB-MIXED CONCRETE-BATCHING AND MIXING: Concrete shall be mixed by a mechanical batch-type mixing plant provided with adequate facilities for accurate measurement and control of each material entering the mixer and for changing the proportions to conform to varying conditions of the work. The mixing-plant assembly shall permit ready inspection of operations at all times. The plant and its location shall be subject to approval.

a. Batching units shall be supplied with the following items:

(1) Weighing unit shall be provided for each type of material to indicate the scale load at convenient stages of the weighing operation. Weighing units shall be checked at times directed by and in the presence of the Contracting Officer, and required adjustments shall be made before further use.

(2) Water mechanism shall be tight, with the valves interlocked so that the discharge valves cannot be opened before the filling valve is fully closed, and shall be fitted with a graduated gage.

(3) Discharge gate shall control the mix to produce a ribboning and mixing of cement with aggregate. Delivery of materials from the batching equipment to the mixer shall be accurate within the following limits:

Material	Percentage by weight	Material	Percentage by weight
Cement - - - - -	1/2	Fine aggregate - - - - -	1
Water - - - - -	1/2	Coarse aggregate - - - - -	2

b. Mixing unit:

(1) Operation: Mixers shall not be charged in excess of rated capacity nor be operated in excess of rated speed. Excessive mixing, requiring addition of water to preserve required consistency, will not be permitted. The entire batch shall be discharged before recharging.

(2) Mixing time shall be measured from the instant water is introduced into the drum containing all solids. All mixing water shall be introduced before one-fourth of the mixing time has elapsed. Mixing time for mixers of 1 cubic yard or less shall be $1\frac{1}{4}$ minutes; for mixers larger than 1 cubic yard, mixing time shall be increased 15 seconds for each additional half cubic yard or fraction thereof.

(3) Discharge lock: Unless waived by the Contracting Officer, a device to lock the discharge mechanism until the required mixing time has elapsed shall be provided on each mixer.

2-12 EXPANSION JOINTS: Expansion joints shall be constructed as indicated on the drawings and as approved. In no case shall the reinforcement, corner protection angles, or other fixed metal items, embedded in or bonded into concrete, be run continuous through an expansion joint.

a. Joints between slabs on earth and vertical surfaces where indicated shall be of premolded expansion-joint filler strips. Unless otherwise noted or specified, such joints shall be 1/2 inch thick and the full depth of slab.

b. Joints with compound: Where joints are indicated to receive joint compound, the premolded expansion-joint filler strips, or other approved premolded strip material, shall be installed at the proper level below the finished floor with a slightly tapered, dressed-and-oiled, wood strip temporarily secured to the top thereof. The wood strip shall be of sufficient depth to form a groove not less than 1 inch deep. After the concrete has set, the wood strip shall be removed and the groove shall be filled with a light-colored calking compound or with compound for poured application. Joint grooves shall be filled approximately flush, so as to be slightly concave after drying.

c. Finish at joints: Edges of cement floors or concrete slabs along expansion joints shall be neatly finished with a slightly rounded edging tool.

2-13 CONSTRUCTION JOINTS: The unit of operation shall not exceed 80 feet in any horizontal direction, unless otherwise required by the drawings. Concrete shall be placed continuously so that the unit will be monolithic in construction. At least 48 hours shall elapse between the casting of adjoining units, unless this requirement is waived by the Contracting Officer. Construction joints, if required, shall be located near the midpoint of spans for slabs, beams, or girders, unless a beam intersects a girder at the center, in which case the joints in the girder shall be offset a distance equal to twice the width of the beam and provision for shear shall be made by use of inclined reinforcement. Joints in columns or piers shall be made at the under side of the deepest beam or girder framing thereto. Columns, piers, or walls of ordinary height shall be poured at least 2 hours before any overhead work is placed thereon. Joints not shown or specified shall be so located as to least impair strength and appearance of work. Vertical joints in wall footings shall be reduced to a minimum. Except where indicated on the drawings, no jointing shall be made in footings or foundation work without written approval. Placement of concrete shall be at such rate that surfaces of concrete not carried to joint levels will not have attained initial set before additional concrete is placed thereon. Girders, beams, and slabs shall be placed in one operation. In walls of buildings having door and window openings, lifts of individual pours shall terminate at top and bottom of opening. Other lifts shall terminate at such levels as are indicated on the drawings, or as conform to structural requirements or architectural details, or both, as directed. Special provision shall be made for jointing successive pours as detailed on drawings or required. To insure a level, straight joint in exposed vertical surfaces, a strip of dress lumber may be tacked to the inside of the forms at the construction joint. The concrete shall be poured to a point 1 inch above the under side of the strip. The strip shall be removed 1 hour after the concrete has been placed, and any irregularities in the joint line leveled off with a wood float, and all laitance removed.

2-14 INSTALLATION OF ANCHORAGE ITEMS:

a. Slots: Slots shall be provided for anchoring ends of masonry partitions abutting concrete.

b. Inserts for hangers for piping and mechanical fixtures will be furnished under PLUMBING and HEATING. These items shall be installed under this section of the specifications as required under PLUMBING and HEATING:

2-15 PREPARATION FOR PLACING: Water shall be removed from excavation before concrete is deposited. Any flow of water shall be diverted through proper side drains and shall be removed without washing ever freshly deposited concrete. Hardened concrete, debris, and foreign materials shall be removed from interior of forms and from inner surfaces of mixing and conveying equipment. Reinforcement shall be secured in position, inspected, and approved before pouring of concrete. Runways shall be provided for wheeled concrete-handling equipment; such equipment shall not be wheeled over reinforcement nor shall runways be supported on reinforcement.

2-16 PLACING CONCRETE: The Contractor will not be permitted to place any concrete in final position except in the presence of an authorized inspector. The use of belt conveyors, chutes, or other similar equipment will not be permitted without written approval. Concrete shall be handled from mixer or transport vehicle to place of final deposit in a continuous manner, as rapidly as practicable, and without segregation or loss of ingredients until the approved unit of operation is completed. Concrete that has attained its initial set or has contained its mixing water for more than 45 minutes shall not be placed in the work. Placing will not be permitted when, in the opinion of the Contracting Officer, the sun, heat, wind, or limitations of facilities furnished by the Contractor prevent proper finishing and curing of the concrete. Forms or reinforcement shall not be splashed with concrete in advance of pouring. Concrete shall be placed in the forms as nearly as practicable in final position. Immediately after placing, concrete shall be compacted by thoroughly agitating in an approved manner. Tapping or other external vibration of forms will not be permitted. Concrete shall not be placed on concrete sufficiently hard to cause formation of seams and planes of weakness within the section. Concrete shall not be allowed to drop freely more than 5 feet in unexposed work nor more than 3 feet in exposed work; where greater drops are required, a tremie or other approved means shall be employed. The discharge of the tremies shall be controlled so that the concrete may be effectively compacted into horizontal layers not more than 12 inches thick, and the spacing of the tremies shall be such that segregation does not occur.

a. Earth-foundation placement: Concrete footings shall be placed upon undisturbed clean surfaces, free from frost, ice, mud, and water. When the foundation is on dry soil or pervious material, waterproof sheathing paper shall be laid over earth surfaces to receive concrete.

b. Rock-foundation placement: Rock surfaces upon which concrete is to be placed shall be approximately level, clean, free from oil and other objectionable coatings, water, mud, debris, drummy rock, and loose semi-detached or unsound fragments, and shall be sufficiently rough to assure satisfactory bond with the concrete. Faults or seams shall be cleaned to firm rock on the sides, and to a depth satisfactory to the Contracting Officer. Immediately before concrete is placed, rock surfaces shall be cleaned by high-velocity air-water jets, sand blasting, or other means satisfactory to the Contracting Officer.

c. Chute placement: When, upon written approval, concrete is conveyed by chute, there shall be a continuous flow of concrete. The chute shall be of metal or metal-lined wood, with sections set at approximately the same slope; namely, not less than 1 vertical to 3 horizontal nor more than 1 vertical to 2 horizontal. The discharge end of the chute shall be provided with a baffle plate to prevent segregation. If the height of the discharge end of chute is more than 3 times the thickness of layer being deposited, but not more than 5 feet above surface of concrete in forms, a spout shall be used, and the lower end maintained as near surface of deposit as practicable. When pouring is intermittent, the chute shall discharge into a hopper. The chute shall be thoroughly cleaned before and after each run. Waste material and flushing water shall be discharged outside the forms.

2-17 COMPACTION: Concrete shall be placed in layers not over 12 inches deep. Each layer shall be compacted by mechanical internal-vibrating equipment supplemented by hand-spading, rodding, and tamping as directed. Vibrators shall in no case be used to transport concrete inside forms. Use of form vibrators will not be permitted. Internal vibrators shall maintain a speed of not less than 5,000 impulses per minute when submerged in the concrete. At least one spare vibrator or sufficient parts for repairing vibrators shall be maintained at the site at all times. Duration of vibration shall be limited to time necessary to produce satisfactory consolidation without causing objectionable segregation and shall be at least 20 seconds per square foot of exposed surface. The vibrator shall not be inserted into lower courses that have begun to set. Where absorptive form lining is used, the vibrator shall not be placed between the forms and the outer row of reinforcement, and in no case shall the vibrator be allowed to touch the absorptive form lining. vibrators shall be applied at uniformly spaced points not farther apart than the visible effectiveness of the machine.

2-18 BONDING AND GROUTING: Before depositing new concrete on or against concrete that has set, existing surfaces shall be thoroughly roughened and cleaned of laitance, foreign matter, and loose particles. Forms shall be retightened and existing surfaces slushed with a grout coat of neat cement. New concrete shall be placed before the grout has attained initial set. Horizontal construction joints shall be given a brush coat of grout consisting of cement and fine aggregate in same proportion as concrete to be placed, followed by approximately 3 inches of concrete of regular mix except that the proportion of coarse aggregate shall be reduced 50 percent. Grout for setting column bases, wall plates, and other metal items shall be composed of equal parts of sand and portland cement, with water sufficient to produce required consistency.

2-19 SLABS ON GRADE: The installation of underground and embedded items shall be approved before slabs are placed. Any fill indicated or required to raise the subgrade shall be installed as specified under EXCAVATION, FILLING, AND BACKFILLING FOR BUILDING CONSTRUCTION. Gravel drainage fill, where indicated, shall be installed to the thickness shown, shall be leveled to a reasonably true and even surface, and shall be covered with kraft paper of the kind used for curing, or with 30-pound asphalt-saturated felt, lapped at least 4 inches at edges and ends. The concrete shall have a slump of no more than 2 inches unless specifically authorized. Concrete shall be compacted, screeded to grade, and prepared for the specified finish.

2-20 FINISHES OF CONCRETE OTHER THAN FLOORS AND SLABS: Slight honey-comb and minor defects shall be patched with cement mortar of 1 part cement to 2 parts fine aggregate. Exposed surfaces shall be given one of the following finishes, as indicated on the drawings or specified:

a. Rough finish: Concrete for which no other finish is indicated or specified shall have fins and rough edges removed.

b. Smooth finish shall be given to all exposed interior and exterior surfaces and shall be obtained by use of hardboard or plywood forms, forms linings, or forms specially designed for reuse. Forms and form linings shall be used in as large sheets as practicable, with smooth even edges, and forms and form linings shall be installed with close joints. Joint marks shall be smoothed off and blemishes removed, leaving finished surfaces smooth and unmarred.

c. Surfaces to receive plaster or shotcrete:

(1) Surface treatment: Surfaces to which plaster or shotcrete are to be applied directly shall be removed to a depth of not less than 1/16 inch by chipping with a pneumatic chisel, by retarding the setting of the surface cement with a compound and removing the surface by scouring, or by other approved method which will expose the aggregate and leave a clean, firm, rough, granular surface. Treatment shall not affect the setting or strength of the cement beyond a depth of 1/8 inch nor prevent the setting of the surface cement within a reasonable time after the forms are removed.

(2) Flexible inserts: In lieu of the chipping or scouring treatment as specified for surfaces to receive plaster on shotcrete, when wood forms are used, flexible dovetail inserts to form cavities for mechanical bonding of the surfacing materials may be used at the option of the contractor. The inserts shall be approximately 3/8 inch deep by 2 inches in diameter, attached to the forms 12 inches on centers in accordance with the manufacturer's directions, and shall be easily removable without damaging the concrete.

d. Sample concrete panels: The contractor shall pour for approval a sufficient number of sample concrete panels when required, to show the surface finishes required. Each panel shall be not less than 6 feet long by 4 feet high. Pouring of concrete requiring the finish indicated by the samples shall not proceed until the sample panel has been approved.

2-21 CONCRETE FLOOR AND ROOF-SLAB FINISHES: Concrete slabs shall be finished as hereinafter described. The dusting of wearing surfaces with dry materials will not be permitted. In preparation for finishing, floor slabs shall be struck off true to the required level at or below the elevation or grade of the finished floors, as shown on the drawings. Floors shall be level with a tolerance of 1/8 inch in 10 feet except where drains occur, in which case the floors shall be pitched to the drains as indicated on the drawings or as directed.

a. Monolithic finish: Floors except those receiving ceramic tile shall be finished by tamping the concrete with special tools to force the coarse aggregate away from the surface, then screeding and floating with straightedges to bring the surface to the required finish level shown on the drawings. While the concrete is still green but sufficiently hardened to bear a man's weight without deep imprint, it shall be wood-floated to a true even plane with no coarse aggregate visible. Sufficient pressure shall be used on the wood floats to bring moisture to the surface. The concrete shall then be hand-troweled to produce a smooth impervious surface free from trowel marks. An additional troweling shall be given the surface for the purpose of burnishing. The final troweling shall produce a ringing sound from the trowel.

b. Wood-float finish: Roof slabs shall be finished by tamping with special tools to force aggregate away from the surface, then screeding with straightedges to bring surface to required line as shown on the drawings. While the concrete is still green but hardened sufficiently to bear the cement finisher's weight, the surface shall be wood-floated to a true and uniform plane with no coarse aggregate visible.

c. Nonslip finish: Entrance platforms having cement finish shall have a nonslip finish produced by evenly sprinkling not less than 1/4 pound of abrasive material over each square foot of the finish cement, which has been screeded level, and finishing with a wood float.

d. Slabs Receiving Ceramic Tile: Slabs receiving ceramic tile shall be finished in the following manner. The slab shall be finished by tamping the concrete with special tools, then screeding with straight edges and floating to present a reasonably true and uniform surface, at an elevation sufficiently below the finished floor elevation, as indicated on the drawings, so that when the mortar setting bed and the tile are in place, the finished surface of the tile will be at the elevation indicated on the drawings. The slabs shall be broomed with a stiff fiber broom after the surface has hardened sufficiently to provide a bonding surface to the setting bed.

e. Power-machine finishing: In lieu of hand finishing, the contractor may use an approved power machine for finishing concrete floors in accordance with the directions of the machine manufacturer. The preparation of concrete surfaces for finishing by machine shall in general be as hereinbefore required for hand finishing.

2-22 CURING shall be accomplished by preventing loss of moisture, rapid temperature change, and mechanical injury or injury from rain or flowing water for a period of 7 days when normal portland cement has been used or 3 days when high-early-strength portland cement has been used. Curing shall be started as soon after placing and finishing as free water has disappeared from the surface of the concrete. Curing may be accomplished by any of the following method or combination thereof, as approved.

a. Moist curing: Unformed surfaces shall be covered with burlap, cotton, or other approved fabric mats, or with sand and shall be kept continually wet. Forms shall be kept continually wet and if removed before the end of the curing period, curing shall be continued as on unformed surfaces, using suitable materials. Burlap shall be used only on surfaces which will be unexposed in the finished work and shall be in two layers.

b. Waterproof-paper curing: Surfaces shall be covered with waterproof paper lapped 4 inches at edges and ends and sealed. Paper shall be weighted to prevent displacement, and tears or holes appearing during the curing period shall be immediately repaired by patching.

c. Membrane curing: Membrane curing compound shall be applied by power spraying equipment using a spray nozzle equipped with a wind guard. The compound shall be applied in a two-coat, continuous operation at a coverage of not more than 200 square feet per gallon for both coats. When application is made by hand sprayers, the second coat shall be applied in a direction approximately at right angles to the direction of the first coat. The compound shall form a uniform, continuous, adherent film that shall not check, crack, or peel, and shall be free from pinholes or other imperfections. Surfaces subjected to heavy rainfall within 3 hours after compound has been applied or surfaces damaged by subsequent construction operations within the curing period shall be resprayed at the rate specified above. Membrane curing compound shall not be used on surfaces which are to receive concrete fill or setting beds, nor on surfaces which are to be treated with hardener. Surfaces coated with curing compound shall be kept free of foot and vehicular traffic and other sources of abrasion during the curing period.

2-23 PRECAST ROOF SLABS: Roof slabs shall be precast of Class AA concrete, conforming to the requirements of this section, and to the designs shown. Reinforcing steel and bars for lifting shall be provided as detailed. Precast slabs shall have an integral waterproofing admixtures of a type approved by the Contracting Officer, incorporated either in the cement used, or in the concrete or water in process of mixing. Surfaces to receive plaster shall be treated for bonding as specified elsewhere in this section. Top surfaces shall have monolithic finish trowelled smooth. Slabs shall be cured as specified elsewhere for other concrete. All slab units shall be marked to identify the unit for proper placement in accordance with the drawings. After curing, slabs shall be stored, stacked and transported in a manner to prevent the development of cracks or other defects. Concrete slabs shall be installed according to the detailed setting drawings and in a careful manner to prevent excessive bending and damage. Slabs shall be set true to line and level. Bearings shall be leveled with cement mortar if required.

2-24 SHOTCRETE: Shotcrete shall be applied where shown on the drawings to the required thickness. The term "shotcrete" used herein and on the drawings is used descriptively to designate a mixture of portland cement and fine aggregate mixed dry, passed through a cement gun and conveyed by air through a flexible tube, hydrated at a nozzle at the end of such flexible tube, and deposited by air pressure in its place of final repose.

a. Mix: Unless otherwise specified, all shotcrete for base coats shall be mixed in the proportion of 1 part cement to 4-1/2 parts of sand by volume. Finish coat shall be a 1 to 3 mix. The proportions of mix shall be changed as required by the Contracting Officer to meet job conditions.

b. Fine Aggregate: Fine aggregate shall conform to the requirements of Federal Specification SS-A-281a. Beach sand may be used subject to the approval of the Contracting Officer.

c. Water: Water used for hydration at the nozzle shall be maintained at a uniform pressure, which shall be at least 15 pounds per square inch above air pressure at the gun.

d. Operating Requirements: For length of hose up to 100 feet, pneumatic pressure at gun shall be 30 pounds per square inch or more. Where length exceeds 100 feet, pressure shall be increased 5 pounds per square inch for each additional 50 feet of hose required. Steady pressure must be maintained.

e. Application: Surfaces to receive shotcrete shall be prepared as hereinabove specified and shall be damped evenly, but not soaked, with a fog spray before the application of shotcrete. Shotcrete shall not be applied to surface upon which free water exists. Material which rebounds and does not fall clear of the work, or which collects on horizontal surfaces, shall be blown off or removed. When an air blowout jet is used to remove rebound, care must be taken to avoid interference with the flow of shotcrete or the nozzleman. Rebound recovered clean and free of foreign matter may be re-used as sand in quantity not to exceed 20 percent of total sand requirements.

f. Construction Joints: Particular care shall be given to formation of construction joints. They shall be sloped to a thin edge and the edge shall be thoroughly wetted before adjacent section of shotcrete is placed. No square joints will be allowed.

g. Curing: Shotcrete shall be damp-cured for at least five days after placing.

SECTION 3

MASONRY; CONCRETE BLOCK

3-01 SCOPE: The work covered by this section of the specifications consists in furnishing all plant, labor, equipment, appliances, and materials, not furnished by the Government, and in performing all operations in connection with the installation of concrete block masonry, complete, in strict accordance with this section of the specifications and the applicable drawings, and subject to the terms and conditions of the contract.

3-02 APPLICABLE SPECIFICATIONS: The following Federal Specifications, of the issues listed below but referred to thereafter by basic designation only, form a part of this specification:

QQ-B-71a	Bars; Reinforcement, (for) Concrete
SS-C-192a	Cement; Portland
SS-C-621	Concrete-Units; Masonry, Hollow
SS-L-351	Lime; Hydrated (for) Structural Purposes

3-03 MATERIALS:

a. Anchors and Ties: Anchors and ties shall be heavily galvanized metal of the following types and shall be furnished as shown on the drawings and specified hereinafter. Design of anchors and the ties shall be as approved by the Contracting Officer.

(1) Wire Mesh Ties: Wire mesh ties shall be not less than 16 gage (steel wire gage), 1/2-inch mesh, 3 inches wide.

(2) Wire Ties: Wire ties shall be not less than 10 gage (steel wire gage) and shall be looped at both ends.

(3) Corrugated or Crimped Metal Ties: Corrugated or crimped metal ties shall be not less than 7/8 inch wide and 22 gage (Manufacturers' Standard Gage).

(4) Bars and Rods: Reinforcing steel bars and rods shall conform to the requirements of Federal Specification QQ-B-71a, type 3, grade 1, 2, or 3.

b. Concrete Masonry Units: Concrete masonry units shall be free of any deleterious matter that will stain plaster or corrode metal, shall be adequately cured before shipment, and the moisture in the units at time of delivery to the building site shall not exceed 30 percent of the maximum absorption value of the units, when tested as specified in paragraph F-2c of referenced specification.

(1) Load-Bearing Units: Federal Specification SS-C-621, type I. Units shall be of standard sizes and shapes including closers and shapes required by the construction.

(2) Non-Load-Bearing Units: Federal Specification SS-C-621, Type II, of standard or modular shape.

c. Mortar Materials: Cement that has been stored in sacks for more than 6 months shall not be used without retesting.

(1) Portland Cement: Portland cement shall conform to the requirements of Federal Specification SS-C-192a, type I. Unless otherwise specified, Portland cement shall be light gray in color.

(2) Lime: Lime shall be hydrated lime conforming to the requirements of Federal Specification SS-L-351, type F, with the further requirement that the total free (unhydrated) calcium oxide (CaO) and magnesium oxide (MgO) in the hydrated product shall not exceed 8 percent by weight, calculated on the "as received" basis.

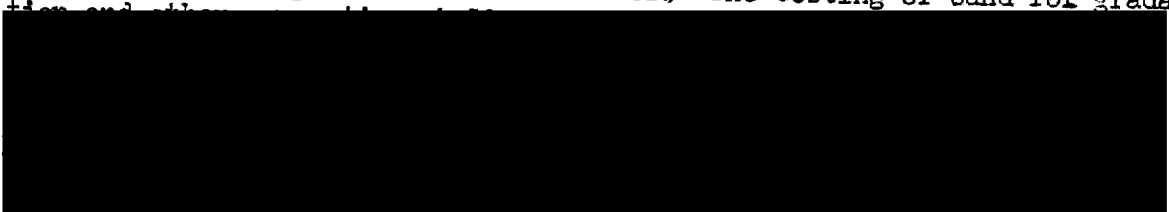
(3) Fine Aggregate: Fine aggregate shall conform to Federal Specification SS-A-281a. Beach may be used subject to the approval of the Contracting Officer.

d. Precast Concrete Trim: Precast concrete trim, so noted on the drawings, shall conform to Federal Specification SS-S-721, type I, with the following additional requirements. The reinforcement for such trim shall conform to Federal Specification QQ-P-71a, type B, grade 1, 2 or 3. The precast units shall have beds and joints at right angles to the face, with sharp, true arrises, shall be properly cured and seasoned before delivery.

e. Water: Water shall be clean and free from injurious amounts of oil, acids, soluble salts, and organic impurities.

3-04. SAMPLES: Samples of all Contractor-furnished materials shall be submitted for approval before delivery and/or purchase of any material.

3-05. TESTING: All testing required will be done by the Contracting Officer without expense to the Contractor. The testing of sand for gradation and other



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3-06. HANDLING, STORAGE AND PROTECTION: Masonry shall be handled in such manner as to prevent undue chipping and breakage. Storage piles, stacks or bins shall be located or protected from contact with soil and

exposure to weather and from heavy and unnecessary traffic. Cement, lime, and any admixture materials, immediately upon delivery to the site, shall be stored in weather proof sheds, or upon platforms raised free of the ground and effectively protected by tarpaulin covers until used. No cementitious or other material that has become caked and hardened from absorption of moisture will be permitted in the work.

3-07 PROPORTIONING OF PORTLAND CEMENT MORTARS: Mortar materials shall be accurately measured by volume and thoroughly mixed until evenly distributed throughout the batch. One bag of Portland cement weighing not less than 94 pounds shall be considered one cubic foot. Class B Portland cement mortar shall be used, and the proportioning of Class B mortar shall be as specified herein. Class B Portland Cement mortar shall be proportioned as follows:

- 1 bag Portland Cement
- 1/2 sack Hydrated Lime or
- 2/3 cubic foot Lime Putty
- 4-1/2 cubic feet Sand, dry

Class B Portland Cement mortar shall possess a minimum strength of 1200 pounds per square inch when tested in cubes or cylinders at the end of a 28-day aging period. The proportion of cement specified is the minimum. Where the fine aggregate, which is locally or readily obtainable, does not produce a mortar having the crushing strength specified but is in all other respects satisfactory, the fine aggregate content shall be decreased to the extent required to obtain that strength with related density, bonding value and other properties.

3-08 PREPARATION AND STORAGE OF LIME PUTTY: Lime putty may be prepared from hydrated lime or quicklime. Hydrated lime shall be mixed with water to form a putty and stored with reasonable care to prevent evaporation for at least 24 hours before use in the mixing of mortar.

3-09 MIXING OF MORTARS: Mortars shall be machine mixed in an approved type of mixer in which the quantity of water can be accurately and uniformly controlled. However, for work requiring only small batches of mortar or grout, or when specifically approved by the Contracting Officer, mortar may be mixed by hand. The mixing time shall be not less than 5 minutes, approximately 2 minutes of which shall be for mixing the dry materials and not less than 3 minutes for continuing the mixing after the water has been added. The proportioning of materials for Class B Portland Cement mortar shall be as hereinbefore specified. Where hydrated lime is used for mortars requiring a lime content, the Contractor will have the option of using the dry-mix method or first converting the hydrated lime into a putty. Hand mixing shall be done in a tight mortar-mixing box. Where the dry-mix method is employed, the materials for each batch shall be well raked and turned over together before the water is added, until the even color of the mixed material indicates that the cementitious material has been thoroughly distributed throughout the mass, after which the water shall be gradually added until a thoroughly mixed mortar of the required plasticity is obtained.

Mortars in which portland is used, shall be prepared in batches of the volume that will be used before initial set takes place, and in no case longer than 45 minutes before delivery to the mason's mortar boards at points of use. Re-tempering will not be permitted.

3-10 ERECTION:

a. General: No units having a film of water on their surface shall be laid in the walls. Units shall be damp before laying. All masonry shall be laid plumb, true to line, with level and accurately spaced courses and reveals, with corners plumb and true, and with each course breaking joint with the course below. Bond shall be kept plumb throughout. Work required to be built in with the masonry, including window frames, door bucks, inserts, sleeves, conduit, anchors, wall plugs, and accessories, shall be built in as the erection progresses. Unless otherwise shown on the drawings or specified, the space around built-up items shall be filled solidly with masonry. Chases, reglets, and pockets shall be built as shown on the drawings or directed by the Contracting Officer. Chases and reglets shall be kept free from mortar or other debris.

b. Concrete Masonry Units: Concrete masonry units shall be erected where shown on the drawings. Each course shall be solidly bedded in class B mortar, hereinbefore specified, with vertical joints breaking halfway over the course below. Vertical and horizontal joints shall be buttered their entire length. Each course shall be bonded at corners and intersections, and shall be either bonded into or anchored to the adjacent construction with metal anchors spaced not over 2 feet on centers in both directions. No cells shall be left open in face surfaces. Units terminating against beam or slab soffits shall be wedged tight with slate or clay tile wedges and the joint shall be slushed solidly with mortar. Jamb units shall be of shapes and sizes required to bond with wall units and shall be built in where shown on the drawings or as required. Steel reinforcement shall be placed where indicated on the drawings in the hollow portion of the block in accordance with the applicable portions of section on CONCRETE, of these specifications. All cells with reinforcement only shall be filled with concrete grout fill. Care shall be taken in application of grout fill and mortar for joints so that cells without reinforcement shall be free of any mortar or grout fill or any foreign matter. Drains shall be installed at locations indicated on the drawings.

(1) Partitions: Partitions exposed to ceilings and at duct, pipe, plenum shafts shall be continuous from floor to underside of slab construction above. Where suspended ceilings are indicated, the partitions in spaces other than the above may be stopped approximately 4 inches above the ceiling level, unless otherwise shown on the drawings. Partitions not otherwise shown shall be 4 inches thick.

(2) Lintels: Lintels in concrete masonry unit partitions, unless otherwise shown on the drawings, shall be constructed by filling the top and bottom cells of the first course over the opening with Class A

concrete as specified in section on CONCRETE, of these specifications. This concrete shall be made with a small coarse aggregate and shall be reinforced with not less than 1/2-inch rods the full length of the lintels shall extend at least 4 inches on each side of the opening. Lintels shall be adequately cured before handling and installation.

(3) Joints: Unless otherwise indicated on the drawings or specified, mortar joints shall be approximately 1/2 inch wide. All joints shall be formed with suitable joints. Joints shall be tooled in such manner as to squeeze the mortar back into the joints. No tooling shall be done until after the mortar has taken its initial set. Concrete masonry units which are not to receive plaster or other covering shall have joints cut off flush and need not be tooled. Masonry work to receive plaster, shotcrete, or other covering shall have joints roughly raked out.

(4) Concrete Grout Fill: Concrete grout fill for concrete blocks called for on drawings as either grout or concrete, shall have an allowable net water content of $7\frac{1}{2}$ gallons per sack of cement, minimum compressive strength at 28 days of 2000 pounds per square inch. The aggregate shall consist of approximately 60% sand and 40% of 3/16 to 3/8 gravel. The maximum slump shall be 7". Care shall be taken that mortar does not drop into cells that are to be filled with grout. Cleanout holes shall be provided at the base of all walls and/or cells which are not to be filled with grout. Approval of the Contracting Officer must be obtained before pouring grout. All cells to be filled with grout shall be cleaned and inspected before filling to insure that they are clean. Cells shall be filled in lifts not less than 4'-0" and not higher than 8'-0". Pours in lifts shall stop at mid-height of blocks to form shear key.

c. Reinforced Concrete Collar Beams: The reinforced concrete collar beams for perimeter of exterior walls and interior partitions shall be formed and placed in accordance with requirements of the structural drawings. All cells of the concrete masonry units of the two top courses shall be filled with grout preparatory to forming to receive collar beam pour. Sixteen (16) mesh bronze screen cloth cut entire width of masonry units shall be placed over all units before mortar bed for two remaining courses is set to act as receiver and retention membrane for grout fill.

d. Cutting and Patching: Cutting and patching of masonry required to accommodate the work of others, shall be performed by masonry mechanics.

e. Unfinished Work: Unfinished work shall be stopped back for joining with new work; toothing may be resorted to only when specifically approved by the Contracting Officer. Before new work is started, all loose mortar shall be removed and the exposed joint thoroughly wetted not less than 12 hours before laying new work.

f. Protection: Surfaces of masonry not being worked on shall be properly protected at all times during the construction operations.

At such time as rain is imminent and the work is discontinued, the tops of exposed masonry walls shall be covered with a strong waterproof membrane well secured in place.

g. Pointing and Cleaning: At completion of the work, all holes in joints of exposed masonry surfaces shall be filled with mortar and suitably tooled. After pointing has set and hardened, all exposed masonry surfaces shall be wetted and then cleaned with a solution of 10 percent by volume of commercial muriatic acid, applied with stiff fiber brushes, leaving the masonry clean, free of mortar daubs, and with tight mortar joints throughout. Immediately after cleaning, the masonry surfaces shall be rinsed down with clear water.

ROOFING; 4 PLY BUILT-UP

4-01 SCOPE: The work covered by this section of the specifications consists in furnishing all plant, labor, equipment, appliances and materials not furnished by the Government, and in performing all operations in connection with the installation of built-up roofing, complete, in strict accordance with this section of the specifications and the applicable drawings, and subject to the terms and conditions of the contract.

4-02 APPLICABLE SPECIFICATIONS: The following specifications form a part of this specification:

a. Federal Specifications:

HH-F-185	Felt; Asbestos Asphalt-Saturated (for)
SS-A-666	Flashing, Roofing & Waterproofing
SS-A-701	Asphalt; (for) Built-up Roofing,
	Waterproofing & Dampproofing
SS-C-153	Asphalt-Primer, (for) Roofing and
	Waterproofing
	Cement; Bituminous, Plastic

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4-03 GENERAL: Asphalt built-up roofing shall be applied to the roof surfaces indicated on the drawings. Metal flashings shall conform to the requirements of Section on SHEET METALWORK.

4-04 MATERIALS:

a. Asphalt: Asphalt for hot application shall conform to the requirements of Federal Specification SS-A-666, type II, Grade 2, Class A, having a softening point of 190 degrees F maximum and 160 degrees F minimum.

b. Asphalt Primer: Asphalt primer shall conform to the requirements of Federal Specification SS-A-701.

c. Asbestos Asphalt-Saturated Felt: Perforated asphalt saturated asbestos felt shall conform to the requirements of Federal Specification HH-F-185, type I, class A.

d. Plastic Bituminous Cement: Plastic bituminous cement shall conform to the requirements SS-C-153. Type I shall be used in conjunction with asphalt-saturated felts. Plastic roofing cement as manufactured by the Acorn Refining Company will be acceptable.

4-05 PREPARATION OF SURFACES: The construction of any bay or section of roof shall be completed before roofing work is begun. Roofing shall not start until roof surfaces are smooth, firm, dry and free from dirt and foreign materials, and have been inspected and approved by the Contracting Officer. Vents and other projections through roofs shall be properly flashed and secured in position, and projecting nails shall be driven firmly home.

4-06 APPLICATION OF ROOFING:

a. General: Four-ply asphalt built-up roofing shall be installed on the prepared concrete roof decks. Asphalt shall not be heated above 400 degrees F. Felts shall not be cut into varying lengths before laying, but shall be unrolled from the full roll immediately, following the asphalt mopping. The felts shall be laid by the shingle method and all surfaces of felt must be fully covered with hot asphalt so that in no case shall felt touch felt. The rolls of felt shall be stacked in properly protected piles until ready for use. The mopping shall in no case be more than 5 feet ahead of the application of felt. Felt shall always be dry when applied. Asphalt shall not be applied to roofing surfaces under a temperature of 325 deg. F. and layers of felt shall be rolled accurately in place, free from wrinkles or buckles, and broomed into the cement using an approved roofing broom. Each layer shall be cemented solidly.

b. Method of Application: The prepared roof surface shall be uniformly coated with asphalt primer, using not less than 1 gallon per 100 square feet. When the primer has dried, a uniform coating of hot asphalt shall be applied using not less than 30 pounds per 100 square feet. Over this coating of asphalt, four layers of 32 inch perforated asphalt-saturated asbestos felt shall be laid by the shingle method over the entire concrete roof surface, lapping each sheet 24 inches over the preceding sheet. End laps shall be not less than 6 inches. When 36-inch felt is used, sheets shall be lapped 27 inches. The full width of the lap of each of these four layers shall be mopped with hot asphalt, using not less than 20 pounds per 100 square feet in each mopping. Layers of felt shall be cut off at abutting vertical surfaces. Layers of felt shall be bent down the roof edge to such length that they shall be entirely covered by the wood fascia. When the laying of the four layers of felt is already finished, the entire surface shall be coated uniformly with hot asphalt, using not less than 60 pounds per 100 square feet.

c. Material Requirement: The roofing shall contain not less than the following quantities of materials per 100 square feet.

Asphalt Primer	7.5 lbs.
4 layers of perforated asphalt-saturated asbestos felt	60 lbs.
Asphalt	150 lbs.

25X1C

4-07 ROOF COATING: The finished roof surfaces shall be coated with asphalt base aluminum paint conforming to the requirements of [REDACTED]. The rate of application shall be not less than 1-1/2 gallons per 100 square feet. "Uniflex" Aluminum Roof Coating as manufactured by The Acorn Refining Company, Ohio, or approved equal will be acceptable. A minimum of 5 days under favorable conditions or longer, if necessary, as directed by the Contracting Officer, is to be allowed for drying time of roofing before applying roof coating.

25X1C

SECTION 5

SHEET METALWORK, GENERAL

5-01 SCOPE: The work covered by this section of the specifications consists in furnishing all plant, labor, equipment, appliances, and materials not furnished by the Government, and in performing all operations in connection with the installation of sheet metalwork other than roof decking, complete, in strict accordance with this section of the specifications and the applicable drawings, and subject to the terms and conditions of the contract.

5-02 APPLICABLE SPECIFICATIONS: The following Federal Specifications, of the issues listed below but referred to thereafter by basic designation only, form a part of this specification:

O-F-506	Flux, Soldering; Paste.
QQ-C-576	Copper Plates, Sawed Bars, Sheets, and Strips.
QQ-I-716	Iron and Steel; Sheet, Zinc-Coated (Galvanized)
QQ-S-571b	Solder; Soft (Tin, Tin-Lead, and Lead-Silver).
QQ-S-636	Steel; Carbon (low carbon), Sheets and Strips.
SS-C-153	Cement; Bituminous, Plastic.
SS-R-451	Roof-Coating; Asphalt, Brushing Consistency.
TT-C-598	Compound, Calking; Plastic (for Masonry and Other Structures).
UU-F-147a	Paper, Building, Waterproofed.

5-03 GENERAL: Surfaces to which sheet metal is to be applied shall be even, smooth, sound, thoroughly clean and dry, and free from all defects that might affect the application. Materials furnished under this section which are to be built in by others shall be delivered to the site in time to avoid delays to construction progress. All cutting, fitting, drilling, and other operations in connection with sheet metal required to accommodate the work of other trades shall be performed under this section. All accessories or other items essential to the completeness of the sheet-metal installation, though not specifically shown or specified, also shall be provided under this section. All such items, unless otherwise shown on the drawings or specified, shall be of the same kind of material as the item to which applied. Nails, screws, and bolts shall be of the types best suited for the intended purpose, and shall be of a composition that will not support galvanic action in the installation. Where sheet metal abuts or members into adjacent materials, the juncture shall be executed in a manner satisfactory to the Contracting Officer. Waterproofed paper, except as otherwise specified, shall be provided as an underlayment for all sheet-metal linings or coverings. Unless otherwise specified, gage of non-ferrous sheet metal shall be Brown and Sharpe (B & S) and for ferrous sheet metal shall be Manufacturers' Standard Gage.

5-04 MATERIALS:

a. Calking Compound: Calking compound shall conform to Federal Specification TT-C-598.

b. Copper: Copper shall conform to Federal Specification QQ-C-576. Except as otherwise specified or indicated on the drawings, sheet copper shall be light cold-rolled temper and shall weigh not less than 16 ounces per square foot.

c. Galvanized Iron and Steel: Galvanized iron and steel shall be copper-bearing, conforming to Federal Specification QQ-I-716, class D1. Except as otherwise specified or indicated on the drawings, sheets shall be not lighter than 26 gage.

d. Uncoated Iron and Steel: Uncoated iron and steel shall conform to Federal Specification QQ-S-636.

e. Paper: Paper shall conform to Federal Specification UU-P-147a, type IV, class B.

f. Plastic Cement: Plastic cement shall conform to Federal Specification SS-C-153, type I.

g. Solder: Solder not otherwise specified shall conform to Federal Specification QQ-S-571b, composition Sn60. Solder for aluminum shall be of a type recommended by the manufacturer of the aluminum.

h. Soldering Flux: Flux not otherwise specified shall be resin, except that for corrosion-resisting steel, nickel-copper alloy, and where conditions of application prohibit use of resin, flux conforming to Federal Specification O-F-506 shall be used.

5-05 SAMPLES: The following samples shall be submitted to the Contracting Officer for approval before purchase and/or delivery of materials:

<u>Item</u>	<u>Quantity</u>	<u>Size</u>
Calking Compound	2	1 lb can
Nails (each type)	1/2 lb	---
Paper	2	12" x 12"
Plastic Cement	2	1 lb can
Screws (each type)	1/2 lb	---
Sheet metal (each weight and type)	2	12" x 12"
Solder	2 bars	---
Soldering Flux	2	2 oz can

5-06 NAILING: Except as otherwise specified or indicated on the drawings, nailing in general shall be confined to sheet metal having a width of less than 12 inches.

5-07 SOLDERING AND SEAMING:

a. Soldering: All edges of uncoated sheet metal to be soldered shall be pretinned before soldering is begun. Soldering shall be done slowly with well-heated coppers so as to thoroughly heat the seam

and completely sweat the solder through the full width of the seam. Ample solder shall be used and the seam shall show not less than one full inch of evenly flowed solder. Soldering shall follow immediately after application of the flux. Upon completion of soldering, acid shall be neutralized and surfaces shall be thoroughly cleaned.

b. Seams: Seams shall conform to the following requirements:

- (1) Flat lock seams shall finish not less than $3/4$ " wide.
- (2) Soldered lap seams shall finish not less than 1" wide.
- (3) Unsoldered plain lap seams shall lap not less than 3".
- (4) All seams shall be made in the direction of the flow.

5-08 FLASHINGS: Flashings shall be installed at all intersections of roofs with vertical surfaces, at all projections through roofs except at plumbing pipe vents, and elsewhere as shown on the drawings or required, to provide watertight protection metal flashings shall be 16-ounce copper.

5-09 LOUVERS: Louvers shall be formed of zinc coated steel sheet of the thickness, size and design indicated on the drawings. Blades shall be neatly formed, accurately fitted, firmly secured, and soldered to the frames. Exposed edges of louver blades shall be folded or beaded for rigidity.

5-10 METAL FLUE AND RAIN HOOD: Furnish and install metal flue liner and rain hood as detailed on the drawings. The flue and rain hood shall be of the diameter indicated and constructed of 16 gage galvanized copper bearing steel sheet. The top flashing collar around the concrete pipe flue wall shall be a continuous circular collar with rolled and soldered joints, riveted to top edge of metal flue as detailed. The four braces supporting rain hood shall be constructed of $1/8$ " x 1" flat galvanized strap steel, securely riveted to hood and flue with stainless steel rivets. The 4-metal clips for securing metal flue at under side of precast slab shall be of hot dipped 14 gage galvanized steel sheet cut 1" wide, formed as detailed, and riveted to metal flue with stainless steel rivets. Top edge of metal flue shall have $1/2$ " diameter holes punched 2" O. C. $1/4$ " below line of circular flashing cap. The circular collar flashing at base of concrete pipe flue structure shall be 20 oz. copper, formed as detailed with sufficient deck spread to be secured as detailed.

5-11 MISCELLANEOUS SHEET METALWORK: Sheet metal items not covered elsewhere in this section shall be as indicated on the drawings and as required to provide a watertight installation. Formed sheet metal for metal-covered work shall accurately reproduce the detail and design shown, and profiles, bends, and intersections shall be sharp, even and true. Joints shall be locked, or lapped, and soldered, as applicable. Reinforcements shall be provided as required.

5-12 PAINTING: All ferrous sheet metal items shall be painted in accordance with the following specifications:
Approved For Release 1999/09/20 : CIA-RDP78-05327A000300090001-3
PROTECTIVE ON METAL,
of these specifications.

SECTION 6

METALS, MISCELLANEOUS

6-01 SCOPE: The work covered by this section of the specifications consists in furnishing all plant, labor, equipment, appliances, and materials not furnished by the Government, and in performing all operations in connection with the installation of miscellaneous metal, complete, in strict accordance with this section of the specifications and the applicable drawings, and subject to the terms and conditions of the contract.

6-02 APPLICABLE SPECIFICATIONS: The following specifications and code of the issues listed below but referred to thereafter by basic designation only, form a part of this specification:

a. Federal Specifications:

FF-B-571a	Bolts; Nuts; Studs; and tap-rivets (and Material for Same)
FF-H-136	Hardware and fittings.
FF-S-91	Screws, Machine; (Including Screws, Set)
FF-S-111a	Screws; Wood
QQ-B-721a	Bronze, Manganese, Bars, Forgings, Plates, Rods and Shapes.
QQ-I-652	Iron, Gray; Castings
QQ-S-636	Steel, Carbon (Low-Carbon) Sheets and Strips.
QQ-S-741	Steel, Structural (Including Welding) and Rivet; (for) Bridges and Buildings.
WW-P-406	Pipe; Steel and Ferrous-Alloy (for) Ordinary Uses (Iron-Pipe Size)

b. American Welding Society Code:

Standard Code for Arc and Gas Welding in Building Construction.

6-03 GENERAL: All items of miscellaneous metal which are to be built into the structure or buildings shall be furnished to the trades concerned, as required during the progress of the work. Where miscellaneous metal items are required to fit existing construction, measurements for the fabrication of such items shall be made at the site.

Standard commercial products which meet the general requirements of the drawings and specifications, and vary only in non-essential details, will be acceptable, subject to the approval of the Contracting Officer. All gages unless otherwise noted shall be U. S. Standard.

6-04 FASTENINGS: Anchors, bolts, expansion bolts; and, in general, all similar items which are not specifically called for under other sections of the specifications, and which are indicated on the drawings, or which are necessary for the proper installation of various parts of the work shall be provided and installed.

6-05 SHOP DRAWINGS: Shop drawings shall be submitted to the Contracting Officer for approval in accordance with the requirements of the Special Conditions.

6-06 MATERIALS:

a. Steel Structural Shapes: Federal Specification QQ-S-741, except that the modification of paragraph F2a(1), as indicated in amendment 3, shall be waived. All necessary holes, sinkages, and reinforcements shall be provided for attaching hardware or other items and suitable provision shall be made for attachment to adjoining construction.

b. Cast Iron: Federal Specification QQ-1-652, of the class best suited for the purpose.

c. Steel Sheets (Uncoated): Federal Specification QQ-S-636.

d. Bronze: Federal Specification QQ-B-721a.

e. Fastenings:

(1) General: Bolts, nuts, screws, washers, and other various fastenings shall be furnished as necessary for the proper erection of the various items of work specified herein. The types and materials of the fastenings shall be suitable for use with the materials which are to be fastened or joined. Fastenings on exterior iron or steel work shall be brass, galvanized steel or other non-rusting type.

(2) Steel Bolts and Nuts: Federal Specification FF-B-571a; types and sizes as required.

(3) Machine Screws: Federal Specification FF-S-91, Types I or II, and of required sizes.

(4) Wood Screws: Federal Specification FF-S-111a, flat or round headed of sizes as required.

(5) Load Expansion Sleeves: Federal Specification FF-H-136, Type 4424, of required sizes.

(6) Load Anchors: Federal Specification FF-H-136, Type 4426, of required sizes.

(7) Flat Washers: Federal Specification FF-H-136, Type 4430, of required sizes.

(8) Toggle Bolts: Federal Specification FF-H-136, Type 4420A, galvanized steel of required sizes.

(9) Four-Wing Short Toggle Screw Anchors shall be as manufactured by Ackerman, or approved equal.

f. Miscellaneous: Materials not specified above shall be as shown on the drawings or as hereinafter specified under the various items.

6-07 SAMPLES: Samples, or catalogue cuts, of all Contractor-furnished material shall be submitted for approval before purchase and/or delivery of materials.

6-08 WORKMANSHIP: Welding shall be continuous along entire line of contact, except where tack welding is shown by the approved shop drawings, or is authorized by the Contracting Officer. Exposed welds shall be ground smooth. Bolting shall be done with proper size bolts. Nuts shall be drawn tight and threads broken or upset. Steel shall be clean and free from mill scale, flake rust, or pitting. All necessary holes, sinkages, and reinforcements shall be provided attaching hardware or other items and suitable provisions shall be made for attachment to adjoining construction. Fastenings shall be concealed insofar as possible. Intersections shall be neatly made and joints inconspicuous. Welding of steel shall conform to the applicable requirements of the Standard Code for Arc and Gas Welding in Building Construction of the American Welding Society.

6-09 THRESHOLDS: Thresholds shall be furnished and installed for all exterior door openings unless specifically shown otherwise and for all interior door openings, which are indicated on the drawings to have thresholds. Thresholds shall be of designs shown on the drawings. Thresholds shall be extruded bronze, set in beds of grout and secured to floors with expansion anchors and flat head countersunk machine screws not over 10 inches apart, or other approved fastenings. Thresholds shall be furnished with anchors where required for the construction.

6-10 MISCELLANEOUS: All miscellaneous metal shown, including fastenings and anchors for same to complete all work not specifically mentioned herein (or included in other sections of the specifications) but shown on the drawings or required, shall be provided.

6-11 PAINTING: All ferrous metal shall be primed as specified in the section entitled, "PAINTING, PROTECTIVE ON METAL."

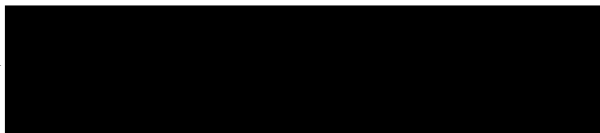
SECTION 7

METAL WINDOWS AND ASSOCIATED WORK

7-01 SCOPE: The work covered by this section of the specifications consists in furnishing all plant, labor, equipment, appliances, and materials, except Government-furnished materials, and in performing all operations in connection with the installation of metal windows and associated work, complete, except glazing in strict accordance with the applicable drawings and this section of the specifications, and subject to the terms and conditions of the contract.

7-02 GENERAL: Metal windows and transoms shall be of the types, sizes, shapes, and arrangement as indicated on the drawings. Transoms shall be of the fixed type. Where frames for doors, windows and transoms adjoin each other, they shall be made as units which can be disassembled for shipping. The contractor shall verify all masonry openings.

7-03 SHOP DRAWINGS: The Contractor shall prepare shop drawings showing details of construction, sizes, ventilator arrangements, operation, methods of anchoring and all other pertinent information, for metal windows, metal screens and door frames, including hardware to be furnished. Shop drawings shall be submitted to the Contracting Officer for approval. Windows shall be equal to the best products of one of the following manufactures or any other approved manufacturer:



Truscon Steel Company, U.S.A.
Detroit Steel Products Company, U.S.A

25X1A

7-04 WINDOWS: Sections of sash and frames shall be hot-rolled, new billet steel bars and shapes especially designed for steel sash, of sizes indicated on the drawings and of thicknesses required to withstand wind pressures of 48 pounds per square foot. The sash shall be completely assembled at the plant of the manufacturer. All units shall have welded connections and shall be joined securely to make a perfect mechanical joint. Joints shall be filled, welded and dressed to produce invisible seams. Sash shall be provided with continuous two-point parallel surface contact between sash and frame sections with overlap at both inside and outside points of closure, insuring a thoroughly weathertight joint. Sash shall be made for glazing 7/32 inch-thick heavy sheet glass using metal glazing clips and glazing compound. Transoms shall be of similar construction. Sliding sash shall have sufficient number of rollers to effect smooth, quiet and easy operation. The double hung windows shall be of the non-weight block, automatic locking type, with brass guide rails and phosphor-bronze weathering strips. Louver sections shall conform to the detail drawings with louver blades spaced 4 inches on centers. Provide insect screens of rewirable frames attached to back of louvers.

7-05 DOOR FRAMES: Frames shall be fabricated of 14-gage steel, and shall be combination buck and jamb with fitted, welded, dressed invisible seams. Frames shall have strike and hinge blocks. Trim shall be pressed into frames or applied with invisible fastenings. Frames shall be provided with spreaders and jamb anchors at 2-foot centers. Door frames shall be galvanized and primed as windows.

7-06 MULLIONS: Mullions shall be pressed steel, flush welded, and of designs shown on drawings. Window mullions shall be 14 gage. Mullions shall be galvanized and primed as windows.

7-07 SCREENS: Screens shall be of the types indicated on the drawings, designed for easy attachment or removal, secure in place and free of rattles. Frames shall be of at least 18-gauge steel or heavier, and able to withstand wind pressures of 50 lbs. per square foot, and shall be galvanized after fabrication as windows. Mesh shall be heavy (.015) 18 x 14 mesh bronze held in place by a removable steel bar. Bar shall be galvanized. Each screen shall be numbered by securely attaching a 1/2" x 1" metal tag to the center of the lower rail of each screen, and a matching tag on each sill. Projected out windows shall be equipped with inside attached hinged wicket type screens providing access to locking handles.

7-08 SHOP FINISH: After fabrication, all windows, frames, mullions shall be cleaned of all grease and dirt and then galvanized in accordance with Federal Specification QQ-I-716. All members shall be given at least one coat of anti-corrosive paint in accordance with Federal Specification TT-P-659.

7-09 INSTALLATION: Windows and door frames shall be set straight and true, to exact lines and levels. All anchors shall be set prior to placing of concrete, or during erection of concrete building blocks. Glazing shall be in accordance with the provisions of section on GLASS AND GLAZING, of these specifications, and shall be done at the time specified by the Contracting Officer.

7-10 CALKING: All joints between windows, doors, louvers, screens and surrounding construction shall be calked as specified in section on CALKING, of these specifications, and as shown on the drawings.

7-11 HARDWARE: Standard window hardware of the manufacturer shall be furnished with windows, complete with necessary fittings and fastenings. Locking handles and strike plates shall be cast bronze.

7-12 ADJUSTMENT: On completion of glazing and all other trades concerned, the Contractor shall inspect all metal windows, doors, screens, and hardware, and make all adjustments necessary for easy and unrestricted operation of all hardware.

SECTION 8

CARPENTRY

8-01 SCOPE: The work covered by this section of the specifications consists in furnishing all plant; labor, equipment, appliances and materials, not furnished by the Government, and in performing all operations in connection with the installation of carpentry, complete, in strict accordance with this section of the specifications and the applicable drawings, and subject to the terms and conditions of the contract.

8-02 APPLICABLE SPECIFICATIONS: The following Federal Specifications, of the issues listed below but referred to thereafter by basic designations only, form a part of this specification:

C-G-456	Glue; Casein-Type, Water-Resistant.
FF-B-561a	Bolts, Lag; Steel (Lag-Screws).
FF-B-571a	Bolts; Nuts; Studs; and Tap Rivets (and Material for Same)
FF-N-101a	Nails; Spikes; Staples; and Tacks.
FF-S-111a	Screws; Wood.
MM-L-736	Lumber and Timber; Hardwood.
MM-L-751c	Lumber and Timber; Softwood.
QQ-L-201	Lead; Sheet.
QQ-S-636	Steel; Carbon (Low-Carbon), Sheets and strips.
QQ-S-741	Steel, Structural (Including Welding) and Rivet; (for) Bridges and Buildings.
RR-S-141a	Screening, Wire, Insect
TT-C-598	Compound, Calking, Plastic (for Masonry and Other Structures)
TT-V-121c	Varnish; Spar, Water-Resisting.
TT-W-570	Wood Preservative, Pentachlorophenol
TT-W-573	Wood Preservative, Wolman-salt (Tanalith)
TT-W-576a	Wood Preservative, Zinc-Chloride
LLL-L-367	Linoleum Plain Jaspe and Marbelized.

25X1C

8-03 MATERIALS:

a. Lumber: Lumber shall conform to the requirements of Federal Specifications MM-L-736 and MM-L-751c. All [REDACTED] Lumber shall possess characteristics equal to those set forth in the grading rules for similar species listed in U.S. Federal Specifications MM-L-736 and MM-L-751c.

25X1A

25X1A

(1) Structural Lumber: Common structural and No. 1 Dimension, Douglas Fir, inland and coast region; or [REDACTED] lumber, [REDACTED] lumber.

25X1A

25X1A

(2) Furring, Grounds & Bucks: No. 2 Boards, Fir, Pine, [REDACTED]

25X1A

(3) Shelving and Miscellaneous Finish: A Finish, Clear, Birch, Maple, Oak, or [REDACTED] or equivalent [REDACTED] lumber. Such lumber shall be free from cracks, twists, and large or excessive knots.

25X1A

25X1A

(4) Doors (Veneer Finish): Shall be Kiln-Dry Grade A, Birch, White Oak over White Pine core, or [REDACTED]

25X1A

25X1A

(5) Door Trim: Shall be Kiln-Dry B and Better, Oak, Ash, of [REDACTED] lumber.

25X1C

b. Plywood: Plywood shall conform to the requirements of [REDACTED]

(1) General Use: Plywood shall be made of Douglas Fir or [REDACTED] lumber, and shall be bonded with type glue, conforming to the requirements of Federal Specification C-G-456.

25X1A

(2) Waterproof Plywood: One-half-inch sheets shall have not less than 5 plies; three-quarter-inch sheets not less than 7 plies and one inch sheets 9 plies or more. Waterproof plywood shall be of American Manufacture only.

c. Bolts and Nuts: Bolts and nuts shall conform to the requirements of Federal Specification FF-B-571a.

d. Calking Compound: Calking compound shall conform to the requirements of Federal Specification TT-C-598, grade 1, for gun application wherever practicable.

e. Clamps, Expansion Bolts, Expansion Screws, Washers, and Anchors: Clamps, expansion bolts, expansion screws, washers, and anchors shall be of steel and iron and of standard type and manufacture.

f. Glue: Glue except for certain plywood (see b above), shall be animal-type, and shall conform to the requirements of Federal Specification C-G-451, grade best suited for the purpose.

g. Lag Screws: Lag screws shall conform to the requirements of Federal Specification FF-B-561.

h. Nails: Nails shall conform to the requirements of Federal Specification FF-N-101, or may be the drive-screw or spiral type of standard manufacture.

i. Sheet Lead: Sheet lead shall conform to the requirements of Federal Specification QQ-L-201.

j. Spar Varnish: Spar varnish shall conform to the requirements of Federal Specification TT-V-121c.

k. Steel Plates and Shapes: Items involving steel plates and shapes shall be made of steel conforming to the requirements of Federal Specification QQ-S-741, of the type, grade, and class normally used in commercial practice.

l. Steel Sheets: Steel sheets shall conform to the requirements of Federal Specification QQ-S-636, either hot-or cold-rolled, and of the class, condition, and finish best suited for the purpose.

m. Wire Screen Cloth: Wire screen cloth shall conform to the requirements of Federal Specification RR-S-141a, type I, II or III, 18 X 14 mesh, heavy.

n. Wood Screws: Wood screws shall conform to the requirements of Federal Specification FF-S-111.

8-04 SAMPLES: Samples of the following materials, if Contractor-furnished, shall be delivered to the Contracting Officer for testing and approval before delivery of the materials to the site:

Calking compound -----	2 pounds
Glue -----	1 pint each kind
Nailing plugs, bolts and screws -----	2 of each kind
Doors -----	2 corner sections, 1 of a typical flush door, and 1 of a typical paneled door.

8-05 LUMBER:

a. Grading: Grading of lumber of the various species shall conform to the requirements of Federal Specifications MM-L-736 and MM-L-731c.

b. Grade Marking: Each piece of yard and structural lumber shall bear the official grade mark of the appropriate inspection bureau or association; or in lieu thereof, each shipment shall be accompanied by a certificate of inspection issued by the appropriate inspection bureau or association, or other agency approved as competent by the Contracting Officer.

c. Sizes and Patterns: Lumber shall be surfaced four sides and the dressed sizes of yard and structural lumber shall conform to the requirements of Department of Commerce Simplified Practice Recommendation R16-39. Lumber shall be tongued-and-grooved, shiplapped, or worked to such patterns as are indicated on the drawings or specified. Worked material, except as otherwise indicated on the drawings, shall conform to the standard patterns of Department of Commerce Simplified Practice Recommendation R16-39.

d. Moisture Content: Unless otherwise specified, lumber shall be air-dried and the moisture content shall be that established by the Contracting Officer. Exterior and interior finishing lumber shall be kiln-dried and at time of delivery to the building site the moisture content shall not exceed 12 percent for material 1 inch or less in thickness, and shall not exceed 14 percent for material over 1 inch thickness. Millwork, which is assembled or built up of more than one piece at the mill, except doors, shall not have a greater moisture content than 12 percent.

e. Storage: Lumber delivered to the site shall be carefully piled off the ground in such manner as to insure proper drainage, ventilation, and protection from the weather.

8-06 TREATED LUMBER: All items of wood framing which are installed in contact with concrete or masonry shall be treated with wood-preserved conforming to one of the following:

Pentachlorophenol, Federal Specification TT-W-570
Wolman-salt (Tanalith) Federal Specification TT-W-573
Zinc-chloride, Federal Specification TT-W-576a

If pentachlorophenol is used as a preservative, mineral spirits must be used as a vehicle. Treatment with coal tar creosote may be approved as a substitute of the above with the prior written approval of the method approved by the Contracting Officer.

8-07 TEMPORARY SUPPORTS: Wood centering or other necessary supports or openings in masonry walls shall be accurately and strongly made, properly braced and secured in position until masonry has thoroughly set.

8-08 ANCHORS: Anchors shall be installed, where specified or shown on the drawings, to anchor carpentry to masonry or concrete. Rough bucks and frames for doors, in masonry or concrete shall be anchored with 3/16-by 1-1/4-inch straps, turned up 2 inches at ends. Anchors shall extend not less than 8 inches into concrete, and 12 inches into concrete blocks. Anchors shall be placed near top and bottom of items and not over 3 feet on centers intermediately. Anchors for wall plates, not otherwise shown, shall be 5/8-inch bolts, 2 feet long, spaced approximately 4 feet on centers and provided with washers. Bent plate anchors shall be provided for posts as indicated.

8-09 NAILING STRIPS AND FACIA: Nailing strips and Facia shall be treated lumber. Strips and Facia shall be of the sizes and shapes shown on the drawings or as required.

8-10 DOOR BUCKS: Masonry and concrete walls and partitions having wood door frames shall have bucks of 2-inch dressed material of width equal to thickness of partition or wall, unless otherwise indicated. Bucks shall be braced, set straight, true, and plumb, and secured with anchors specified hereinbefore.

8-11 GROUNDS: Dressed wood grounds shall be furnished for securing all wood trim including vertical wood siding, cabinets, casings, and wherever else required. Grounds shall be set rigid, in perfect alignment, and shall be trued with a long straightedge. Grounds shall be 1-1/2 inches wide and of a thickness to provide for not less than 3/4 inch of plaster from nearest face of plaster base material to the finished face of plaster. Grounds shall be nailed to wood blocking and secured to masonry or concrete as specified for furring. Temporary grounds shall be set for plasterwork. Spot grounds for metal flashing shall be set 12 inches on centers, unless otherwise indicated on the drawings. All grounds shall be treated lumber.

8-12 FURRING: Unless otherwise indicated, furring shall be 1-by 2-inch strips, 16 inches on centers, installed vertically on walls where shown. Furring shall be secured to masonry or concrete walls with approved nailing plugs or clips set in masonry or concrete at top and bottom of walls and 2 feet on centers intermediately. Furring strips against hollow concrete block units shall be secured by toggle bolts, anchor bolts, or other approved devices. Furring strips shall be provided around all openings, angles, and corners, and for other similar conditions. Furring strips shall be erected plumb and rigid, using wood shims wherever necessary. The face of furring strips shall form a true even plane for finish material. Furring strips to support built-in cabinets shall be provided. All furring strips shall be treated lumber.

8-13 WOOD LOUVER VENTILATORS: Wood louver ventilators shall be built according to details. Plank frame shall be routed out to receive the louver slats. Louver slats shall be not less than 3/8 inch thick and of the width shown. Louvers shall be made of Fir, Pine, [REDACTED] lumber.

25X1A

25X1A

8-14 DOOR FRAMES, INTERIOR: Unless otherwise shown, interior door frames shall be 1-5/16 inches thick, full width of finished wall or partition, double-rabbeted from the solid. Frames shall be set plumb and square, and secured with finishing nails. Double-wedge blocking shall be driven back of jambs at nailing points, also at back of butts and lock strikes. Frames in masonry where no bucks are indicated or required, shall be double-rabbeted from the solid of 2-inch stock and shall have three-jamb anchors on each side.

8-15 DOORS; GENERAL: Doors shall be the best products of any manufacturer whose products conform to the requirements of the National Door Manufacturers' Association. Doors shall be flush type as shown on the drawings. Doors shall be free from loose knots, warpage, cracks and other defects. These defects or excessive shrinkage will be cause for rejection and such doors shall be replaced at the Contractor's expense. Doors shall be sanded smooth for painting. Doors shall be given one primer coat of paint at the factory. Top and bottom edges of doors shall be given two coats of spar varnish.

a. Interior Flush Doors: Flush doors shall be hollow-core. Hollow cores shall be of the grid type or of the horizontal bar type. The core shall be constructed of white Cedar, [REDACTED] or equivalent [REDACTED] wood. Grid type cores shall have stiles not less than 1-1/8 inches wide and rails not less than 2-1/8 inches wide, which shall be fitted together with dovetailed joints or connected by means of staples or other suitable fasteners. A lock block shall be provided at the center of each stile, 18 inches long and wide enough to provide 4 3/4 inches from the edge of door to inside edge of lock block. Cross rails, 1-1/16 inches wide, may be provided at the top and bottom of the lock blocks. The space inside the frame shall be filled with a grid formed of strips of fiberboard of 3/16 inch strip of wood halved together on approximately 2-inch centers. Wood-grids shall be fitted into grooves, in the stiles and rails. Horizontal bar type cores shall have stiles not less than 4" wide and three rails not less than 4" wide assembled with dowels, using two at each joint. Horizontal bracing bars, 3/8-inch thick and spaced approximately 3" on centers, shall be mortised into the stiles. The entire core shall be assembled with water-resistant glue and dressed to uniform parallel planes and to a thickness of 3/8" less than the specified thickness of the door. Face veneers shall be Birch, Oak, [REDACTED] lumber, and shall be in two layers on each face. The first layer shall be 1/8" thick applied with the grain horizontal and the outer layer 1/16" thick with the grain vertical. The stiles shall be covered by an edge strip of the same species as the face veneer. The edge strip shall be 1/2 inch thick and of such width that it will abut the edge of the inner veneer and be lapped by the face veneer. All veneers shall be secured with water resistant glue applied to all contact surfaces and the whole door placed in a gluing press which will apply uniform pressure over the whole of the door. The completed door shall be sanded on both faces and edges. All corners shall be rounded to 1/32" radius.

b. Exterior Flush Doors: All exterior flush doors shall be hardwood veneered and shall have solid cores of the stile-and-rail-type. Hardwood veneered doors shall have face veneers of standard commercial thickness and combined thickness of cross handing and face veneer on each face shall be not less than 1/8 inch before sanding. Otherwise, hardwood-veneered doors shall conform to CS171-50, Grade 1P with birch or gum face veneer.

c. Plywood Doors: Plywood doors shall be 3/4-inch thick with edges faced with solid hardwood not less than 1/2 inch thick as detailed.

d. Screen Doors: Screen doors shall be constructed as detailed on the drawings. Stiles and rails shall be rabbeted on one side to receive the screen. The wire screen shall be stretched taut and secured in place. The edges of the wire screen shall be covered with molding mitered at corners. Wire screen shall be as hereinbefore specified.

e. Rolling shutter doors for metal louvers under windows shall be panel type doors consisting of birch, oak or other approved hardwood rails assembled by mortise and tenon, rabbeted for 3/4 inch plywood panels, all assembled by using waterproof glue.

f. Sliding Doors: Sliding doors shall be of sizes and thickness indicated on the drawings, and shall be equal in construction and quality to the flush doors hereinabove specified.

g. Glass in Wood Doors: Glass shall be of the size indicated on the drawings and as specified in section on GLASS AND GLAZING, of these specifications. The glass shall be secured to the doors with solid hardwood mouldings as detailed on the drawings.

8-16 FITTING, HANGING AND TRIMMING: Doors shall be fitted, hung and trimmed as hereinafter specified and as indicated on the drawings. Doors shall have 1/16" clearance at sides and top, and 3/16" clearance over thresholds, unless otherwise directed by the Contracting Officer. Doors in openings without thresholds shall have 3/8" clearance. Doors shall be hung and trimmed with hardware conforming to the requirements of Section on BUILDERS' HARDWARE, of these specifications. Locks with standardized cases shall all be installed at the same height. Knob locks and knob latches shall have the center of the knob 38" above the finished floor. Cylinder dead locks shall have the center of the cylinder at the same height as the center of the cylinder of knob locks.

8-17 INTERIOR FINISH: Interior finish shall be manufactured of the woods specified. Wood specified to be stained or finished natural shall be uniform in color. Interior finish, including doors, shall not be brought into building until plaster is thoroughly dry. Finish may be stored at the site only in weathertight sheds and at the risk of the Contractor. Interior finish shall be milled, fabricated and erected as shown on the drawings. Interior finish shall be machine-sanded at the

mill and sandpapered smooth at the building when necessary. All interior trim shall be of design and type indicated on the drawings or approved by the Contracting Officer. Interior trim to be set against plaster or wood in the building shall be run with hollow backs. Joints shall be made in an approved manner to conceal shrinkage and be tight. Trim shall be secured with fine finishing nails and with screws and glue where required. Nails shall be set for putty-stopping. Wood finish shall be set straight, plumb or level in perfect alinement and shall be closely fitted. Window, closet and door trim, shall be in single lengths, and shall be 2nd grade [REDACTED] or equal, clear of knots on two sides. Finish shall be nailed to grounds and drawn tight against plaster. Casings shall be 3/4" by the width shown, with mitered corners. Casings shall be set back 3/8" from the face of jambs and nailed to finished and rough jambs and grounds. Miters shall be glued and shall have miter bolts, rings or other approved devices for securing the two members securely together.

25X1A

8-18 CLOSETS: Closets shall be of the size and design shown. Shelving shall be waterproof plywood with hardwood edges. Shelves shall be supported on wood cleats as shown. The closets shall be provided with one shelf and round galvanized pipe for hanging clothes.

8-19 KITCHEN CABINETS: Wood kitchen cabinets shall be as indicated on the drawings.

a. Fabricate from sound, kiln-dried lumber as specified with frames, rails, stiles and intermediate members not less than 3/4" thick and of sufficient width to insure sturdy rigid construction. Provide 1/4" plywood backs.

b. Work tops for base cabinets and splash back shall be waterproofed plywood faced top and bottom with 1/8" thick hard-pressed fiberboard with a top covering of plastic laminate trimmed at all edges and corners with stainless steel mouldings.

c. Shelves may be of 5 ply plywood or solid stock not less than 3/4" thick. Shelves to be stationary and rest on cleats or on metal pins set into holes. Support open shelving on cleats securely fastened to adjacent construction.

d. Doors and drawer fronts shall be of 5 ply plywood 3/4" thick, with hardwood edges. Slide drawers on hardwood slides with stops. Partition one drawer for silverware.

e. Sink Rims: Provide "Hudee" stainless steel sink frames, as manufactured by Walter E. Selck & Co., Chicago, or equal. Sinks are specified in "PLUMBING; INTERIOR".

f. Erect cabinets, shelving, etc., straight, level and plumb. Securely anchor in place to walls and ceiling. Apply hardware specified in "HARDWARE; BUILDINGS" after painting.

g. Shop drawings shall be furnished correctly dimensioned to fit spaces as erected, and approval by the Contracting Officer shall be obtained before fabrication.

h. Prefabricated wood kitchen cabinets, shelving, work tables, and counters (factory assembled complete with hardware) may be furnished if equal to requirements specified herein and if variations standard with manufacturer are approved by the Contracting Officer. Same hardware as specified.

8-20 VENETIAN BLINDS: Venetian blinds, where called for on the drawings, shall be over lapping type, shall be the products of approved American manufacturer and shall be fabricated as follows:

a. Head box shall be not less than 0.032 inch thick aluminum enclosed including top and shall have a high baked enamel finish on bonderized surface.

b. Slats shall be 2 inches wide and 0.010 inch thick of extra hard aluminum alloy finished with high baked enamel on bonderized surface. Slats shall be flexible concave form with cleanly cut route holes and ends.

c. Bottom rails shall be metal finished with high baked enamel on bonderized surface.

d. Bracket shall be heavy treated steel finished with high baked enamel.

e. Tilting shall be self-leveling with brass worm gear and smooth, quiet operation.

f. Cord lock shall be an automatic cord stop which holds blinds raised at any level without the necessity of securing the lift cord.

g. Tape shall be good quality, free from defects.

h. Cords shall be good quality No. 4-1/2 braided cord, glazed to repel dirt and minimize wear.

i. Head boxes shall be securely fastened at all points provided by the manufacturer. Screws shall be of the proper size and length to adequately support the weight of the head box and blind assembly. Where intermediate support brackets are required on blind assemblies over 36 inches in length, they shall be located at points in the erection and assembly literature furnished by the manufacturer.

8-21 MEDICINE CABINETS: One recessed medicine cabinet with a mirror door approximately 16 inches by 22 inches shall be installed over each lavatory in toilet room. The cabinet body and backing for

the door shall be made of steel not less than 0/0368 inch in thickness. The mirror shall be a No. 1 quality plate-glass mirror not less than 3/16 inch thick double-silvered and protected with electrodeposited copper and protective paint. The mirror shall be framed with a channel of chromium-plated brass or corrosion-resisting steel. The cabinet shall be provided with a razor-blade slot and with three adjustable bulb-edged glass shelves. The door shall be hung on a piano hinge and shall be fitted with a bullet catch and a bar stop. Two rubber bumpers shall be provided on the door or on the cabinet. Hinge, catch, stop and shelf supports shall be made of chromium-plated brass or corrosion-resisting steel. The cabinet body and backing for door shall have an enamel finish.

8-22 SUSPENDED CEILING: Suspended ceiling shall be constructed as detailed on the drawings. Nailers and furring strips shall be secured to adjoining construction with bolts or other approved devices. Hangers, nailers and furring strips shall be of the sizes indicated on the drawings.

8-23 SHELVING: Shelving shall be 3/4-inch-thick waterproof plywood. Shelves shall be of the width shown and shall be spaced as indicated or directed by the Contracting Officer. Exposed edges of shelves shall be faced with solid hardwood not less than 1/2 inch thick.

8-24 SCREENED PORCHES: All necessary wood framing, complete with moldings, shall be provided and installed on screened porches to receive the wire screen cloth hereinbefore specified.

8-25 HARDWARE: Items of hardware specified in section on BUILDERS' HARDWARE, of these specifications, shall be carefully fitted and securely attached. Care shall be exercised not to mar or injure existing work. Upon completion of the work and in the presence of the Contracting Officer, all hardware shall be demonstrated to work freely, all keys shall be fitted into their respective locks and, upon acceptance of the work, all keys shall be tagged and delivered to the Contracting Officer.

8-26 MISCELLANEOUS ITEMS: Contractor shall furnish and install all miscellaneous items of rough and finish carpentry, not specifically mentioned in this section of the specifications, but shown on the drawings or required to complete the work.

8-27 PRIMING: Millwork except work to receive stain and natural finish, shall be primed as specified in section on PAINTING, GENERAL, of these specifications.

SECTION 9

CALKING

9-01 SCOPE: The work covered by this section of the specifications consists in furnishing all plant, labor, equipment, appliances, and materials not furnished by the Government, and in performing all operations in connection with the application of calking, complete, in strict accordance with this section of the specifications and the applicable drawings, and subject to the terms and conditions of the contract.

9-02 WORK INCLUDED: This section includes all calking occurring in connection with construction of buildings.

9-03 APPLICABLE SPECIFICATION: The following Federal Specification forms a part of this specification:

TT-C-598 Compound, Calking; Plastic (for Masonry and Other Structures)

9-04 MATERIALS: Materials shall conform to the following requirements:

a. Calking Compound: Calking compound shall conform to the requirements of Federal Specification TT-C-598, grade 1. The color of the calking compound shall match the color of the mortar joints. Delivery of the calking compound to the building site shall be in the manufacturer's original sealed packages.

b. Sealer: The sealer for the joint grooves in masonry shall be a quick-drying liquid, and of a type and consistency recommended by the manufacturer of the calking compound.

c. Rope Yarn: Rope yarn shall be the raveled strands of rope fiber from oil or other staining element.

9-05 SAMPLES: Before the work of application is started, samples of all materials proposed for use shall be submitted to the Contracting Officer for approval.

9-06 APPLICATION: Calking shall be installed in joints around wood or metal frames built into masonry, concrete and in any other joints so indicated on the drawings and as specified under other sections of these specifications. Calking compound shall be applied by the gun method using nozzles of proper sizes to fit the several widths of the joints. The type of gun shall be subject to approval by the Contracting Officer.

a. Preparation: Calking in joints shall be a minimum of 3/4" in depth and 1/4" in width unless otherwise indicated on the drawings.

Where adequate grooves for calking have not been provided, grooves shall be prepared by cutting and cleaning out the mortar to the minimum depth and by grinding to the minimum width, taking care that adjoining metal work is not reduced in section. Where the joint depth is such as to require an excessive amount of compound (over $2\frac{1}{2}$ ") the joint may be calked to a depth of one inch from the surface with 1:1 mortar. All particles of mortar, dust, and other foreign matter shall be brushed out and, just prior to calking, the joint grooves shall be coated with an application of sealer. Where a suitable mortar backstop has not been provided, the back of joint grooves shall be packed tightly with rope yarn.

b. Calking: The compound shall be driven into the joint grooves with sufficient pressure to force out all air and to solidly fill the joint grooves. Calking, where exposed, shall be free of wrinkles, and shall be uniformly smooth. Joints in precast sills and other wash surfaces shall be filled slightly convex to obtain a flush joint when dry. Calking around all openings in masonry shall include the entire perimeter of each opening. Upon completion of the calking, any calked joints not entirely filled shall be roughened and filled as specified and the exposed surface tooled smooth.

c. Cleaning: The surfaces of all materials adjoining calked joints shall be cleaned of any smears of compound or other soiling due to the calking application.

SECTION 10

LATHING AND PLASTERING

10-01 SCOPE: The work covered by this section of the specifications consists in furnishing all plant, labor, equipment, appliances and materials, not furnished by the Government, and in performing all operations in connection with lathing and plastering, complete, in strict accordance with this section of the specifications and the applicable drawings, and subject to the terms and conditions of the contract.

10-02 WORK NOT INCLUDED: Wood furring, suspended wood ceilings and wood grounds are specified and included in the section entitled "CARPENTRY."

10-03 APPLICABLE SPECIFICATIONS: The following Federal Specifications of the issues listed below but referred to thereafter by basic designation only, form a part of this specification:

FF-N-101	Nails; Spikes; Staples and Tacks
QQ-B-101c	Bases, Metal; (for) Plaster and Stucco Construction
QQ-W-461	Wire, Steel (Carbon); Base and Zinc-Coated
SS-C-192a	Cements; Portland
SS-L-351	Lime; Hydrated (for) Structural Purposes

10-04 GENERAL: Portland Cement plaster herein specified shall be as installed in the locations shown on the drawings. Plastered ceilings shall include beams, soffits, furred spaces and other overhead plasterwork, unless otherwise specified or shown on the drawings. Plastered walls shall include partitions, columns, pilasters, plastered jambs, and other returns, reveals and backs of recesses and alcoves, and jambs and heads of windows and doors, unless otherwise specified or shown on the drawings. Plaster on walls, except the finish coat, shall be carried to the floor between grounds back of projecting metal or wood bases, cabinets and other fixed equipment. The finish coat of plaster shall not be applied on walls of rooms having tile wainscots until after the wainscots have been installed. All walls and partitions around rooms or spaces having plastered walls and acoustical-treatment ceilings shall be plastered complete before the ceilings are installed.

10-05 MATERIALS:

a. Hydrated Lime: Federal Specification SS-L-351, Type F, with the further requirement that the total free (unhydrated) calcium oxide (CaO) and magnesium oxide (MgO) shall not exceed 8 percent by weight calculated on the "as received" basis.

b. Portland Cement: Federal Specification SS-C-192, Type I.
Approved For Release 1999/09/20 : CIA-RDP78-05327A000300090001-3

c. Wire: Wire for tying and lacing metal lath shall be annealed wire 18 gage weight C zinc coating, grade FS-1020, Federal Specification QQ-W-461

d. Nails: Where metal lath is applied over sheathing, metal, masonry or concrete surfaces, an approved type of furring nail which will permit the formation of plaster keys not less than 1/4 inch in thickness between the metal and the backing shall be used. Nails for attaching metal lath to horizontal wood supports shall be 1-1/2 inch, 11-gage, barbed roofing nails with 7/16-inch-diameter heads, and to vertical wood supports shall be 4d common nails or 1-inch roofing nails with 7/16-inch-diameter heads driven to a penetration of at least 3/4 inch, or 1-inch, 14-gage, wire staples driven home. Nails or staples for attaching 3/8 inch rib lath to horizontal or vertical wood support shall be 3/8 inch longer than those specified above, unless attachment is through rib in which case equivalent penetration into the supports shall be provided. Common nails shall be bent over to engage at least 3 strands of flat lath or the rib of 3/8 inch rib lath.

e. Metal Corner Beads, Corner Grounds, Casings and Base Screeds: Metal corner beads, corner grounds and base screeds shall be as follows:

(1) Corner Beads (Expansion Type): Corner beads shall be not lighter than 26 gage galvanized metal, shall be formed with a bead not exceeding 3/16-inch, and shall have flanges at least 2-1/2 inches wide.

(2) Corner Grounds and Casings: Corner grounds and casings shall be not lighter than 26-gage galvanized metal, with or without expanded metal wing as indicated and of sizes shown on the drawings.

(3) Base Screeds: Base screeds shall be not lighter than 26-gage galvanized metal weighing not less than 160 pounds per 1000 lineal feet, and having a depth of 1/2 inch. The screeds shall be shimmed cut to the required plaster thickness.

f. Metal Lath: Federal Specification QQ-B-101c, type F3/8R (3/8-inch-rib base) or type F (flat base). Type F and Type F3/8R shall be expanded metal lath, cut from copper-bearing steel sheets, hot-dip galvanized after fabrication and shall weigh not less than 3.4 pounds per square yard.

g. Sand: Sand shall be hard, clean, sharp, free from injurious materials and conform to [REDACTED]

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h. Plaster-Base Accessories:

(1) Corner lath shall be strips of galvanized expanded metal 6 inches wide bent to form two 3-inch wings, and weighing not less 2.5 pounds per square yard.

i. Water: Water shall be clean and free from oils, acids, alkalis, organic or other injurious matter.

10-06 SAMPLES OR DESCRIPTIVE DATA: If materials are Contractor-furnished, the following samples or descriptive data and method of installation shall be submitted to the Contracting Officer for approval.

<u>Item</u>	<u>Requirement</u>
Base Screeds	Data
Corner Beads (each type)	Data
Corner grounds and casings	Data
Lime	Data (brand name)
Metal lath (each type)	Data

10-07 DELIVERY AND STORAGE OF MATERIALS: All Contractor-furnished manufactured materials shall be delivered in the original packages, containers and bundles bearing the name of the manufacturer and the brand. Plaster, cement and lime shall be stored off the ground under watertight cover, and away from sweating walls and other damp surfaces, until ready for use. Damaged or deteriorated materials shall be removed from the premises.

10-08 CHASES: All chases in masonry walls or partitions less than 12 inches wide shall be covered with strip lath, lapped and securely laced with tie wire at joints between sheets, and secured to the masonry or other plaster base with galvanized offset-head or hook-head lath nails. The strip or sheet lath shall lap over the masonry or both sides of the chase not less than 3 inches, with the edges nailed or otherwise secured in a manner that will keep the lath flat against the surface of the masonry.

10-09 INSTALLATION:

a. Base Screeds: Base screeds shall be placed 4 inches above the finished floor, unless otherwise shown on the drawings. The screeds shall be set level and true to line. Base screeds shall be installed in lengths as long as practicable, and shall have the joints in straight runs aligned with suitable formed splice or tie plates. Screeds applied on metal lath shall be secured with tie wire. Where the structural backing is concrete or masonry, the base screeds shall be secured with galvanized nails or drive screws driven into fiber plugs or wood grounds set in the masonry, by concrete stubnails, by ties in the mortar joints, or by other standard practice approved by the Contracting Officer. Fastenings shall be spaced not more than 12 inches on centers, except that nailing into concrete shall be not over 8 inches on centers.

b. Corner Beads: Corner beads shall be provided, full height, on all external wall plaster corners, including plastered jambs and heads of recessed door openings, windows and recesses, and on other corners where indicated on the drawings. Corner beads shall be in single lengths where the length of a corner or jamb does not exceed the standard stock lengths. Splices shall be made with perfect alignment.

The beads shall be neatly mitered or coped at corners, and shall be securely fastened with the wire, galvanized staples, off-set head or hook-headed lath nails, spaced not more than 8 inches on centers, and staggered in the two wings.

c. Corner Laths Where plaster finish is required, corner lath shall be installed in the following locations:

(1) At interior angles where the abutting surfaces are of different materials.

(2) At interior angles where the abutting surfaces are metal lath, except where flat-base metal, type F, is continued around the corner not less than 3 inches.

(3) At interior angles where both abutting surfaces are concrete masonry units, not bonded with or anchored to each other.

(4) At junction between ceiling and wall or partition surfaces, except where the metal lath of suspended ceilings is turned down at least 3 inches on the walls.

Corners shall be tied securely to abutting lathed surfaces at the outer edges only. Corner lath shall be fastened to masonry and concrete surfaces as specified above for the fastening of base screeds and corner beads.

d. Strip Lath Strip lath, not less than 3 inches wide, shall be installed over the joints between dissimilar base materials where surfaces to be plastered lie in the same plane, and where the base materials cannot be effectively bonded or anchored together.

e. Corner Grounds and Casings Corner grounds and casings shall be installed where indicated on the drawings and where plaster abuts other materials, in accordance with the best practices of the trade, and as approved by the Contracting Officer. Metal casings and corner grounds shall be attached as specified above for screeds.

f. Metal Lath Metal lath shall be installed at locations indicated on the drawings. Lath shall be applied in such manner as to form true surfaces, straight or in fair curves, without sags or buckles and with the long dimension of the lath at right angles to the direction of the supports. Metal lath shall be applied to walls with the lower sheet lapping over the upper sheet. Metal lath shall be secured to supports at intervals not over 6 inches on centers. Side laps of lath on walls and partitions shall be secured to supports and tied at intervals not over 9 inches between supports. Side laps of lath on ceilings shall be secured to supports and tied at intervals not over 6 inches between supports. Type F metal lath may be used over vertical or horizontal supports spaced up to and including 16 inches on centers. Type F3/8R metal lath may be used over vertical or horizontal supports spaced up to and including 24 inches on centers. Lath shall be extended from furred spaces at least 4 inches onto the face of unfurred spaces which are to receive plaster.

(1) Ribbed Lath (Type F3/8R): Ribbed lath applied to walls and ceilings shall be battened at angle and corner intersections and reinforced with corner lath. Side ribs shall be nested. End laps of adjoining sheets shall be lapped not less than one inch. Such laps shall be staggered, and shall in all cases occur over supports. Lath applied direct to concrete columns and beams shall be secured either with lathing nails, driven through the meshes into fiber plugs or other approved type of anchorage insert, or with wire loops built into the concrete.

(2) Flat-Base Lath (Type F): Flat-base shall be lapped at the side not less than 1/2 inch. Adjoining sheets of small opening lath shall be lapped at the ends not less than 1-inch, and such laps shall be staggered and, in all cases, occur only over supports. The ends of all flat-base lath sheets shall be at least one support distant from any angle or corner, and the sheet shall be bent into the re-entrant angle or around the corner; otherwise, corner lath shall be used. Flat lath applied to ceilings shall be bent at the intersection with plastered walls, partitions and other vertical surfaces, and shall be carried down at least 6 inches.

10-10 GROUND: Wood grounds, installed under the section entitled "CARPENTRY" of these specifications, shall develop the thickness of plaster as shown on the detail drawings. Spot grounds not more than 1-1/2 inches in width or diameter, shall be provided where directed by the Contracting Officer. Spot grounds shall be firmly attached to the backing and shall not be removed until the brown coat has been completed to the satisfaction of the Contracting Officer. The spaces left by the spot grounds shall be filled flush with the surface.

10-11 MIXING OF PLASTER: Except when handmixing of small batches is specifically approved, mechanical mixers of an approved type shall be used for the mixing of plaster. Caked or lumped materials shall not be used. Mechanical mixers, mixing boxes, and tools shall be cleaned after mixing each batch and kept free of plaster from previous mixes. Plaster shall be thoroughly mixed with the proper amount of water until uniform in color and consistency. Retempering will not be permitted, and all plaster which has begun to stiffen shall be discarded. Portland cement plaster for all coats shall be mixed in the proportion by volume of one part cement, 3 parts sand, and 1/4 part lime putty. Where the sand is rather fine and/or too uniform in size of grains, the proportion of sand given above shall be reduced to 2 1/2 parts in the finish coat, and may be reduced to 2-3/4 parts in the scratch and brown coats.

10-12 APPLICATION OF PLASTER: Surfaces that are to receive plaster shall be clean and free of defects. Where necessary to reduce suction, masonry surfaces shall be dampened evenly, but not soaked, with a fog spray. Regulated ventilation shall be provided. Plastering shall be 2 coat work on concrete and masonry, and 3 coat work on other plaster bases. Finish coats shall have a reasonably uniform thickness of approximately 1/8-inch, and shall not be less than 1/16 inch in thickness at any point. Ceilings shall be level and walls shall be straight and plumb. Corners and interior angles shall be square, with arrises slightly rounded. The thicknesses of plaster, from the face of plaster base to the finished plaster surfaces, shall be not less than 3/4 inch over metal lath, except

as otherwise shown on the drawings. Plaster on concrete and masonry surfaces shall be 1/2-inch thick, except as otherwise shown or specified.

a. Portland Cement Plaster:

(1) Scratch Coat: The scratch coat shall be full and thick and shall be applied with sufficient force to form good keys. The scratch coat shall be cross scratched upon attaining its initial set and shall be kept damp with a fog spray. On concrete and masonry surfaces (except where plaster is shown on the drawings to be 3/4 inch thick) the first coat shall be doubled back with the same mix, straightened to a true surface and left ready for finish coat.

(2) Brown Coat: The brown coat shall be applied after the scratch coat has set, but not less than 24 hours after the application of the scratch coat. The brown coat shall be lightly scratched and broomed, shall be kept moist with a fog spray for 2 days, and then be allowed to dry.

(3) Portland Cement Finish Coat: The finish coat shall not be applied until the brown coat has seasoned for 7 days. Just before application of the finish coat the brown coat shall again be evenly moistened with a fog spray. Where cement plaster is indicated on the drawings, the finish coat shall be first floated to a true and even surface, then troweled in a manner that will force the sand particles down into the plaster and, with the final troweling, leave the surface burnished smooth and free from rough areas, trowel marks, checks or other blemishes. The finish coat shall be kept moist with a fog spray for at least 2 days, and thereafter shall be protected against rapid drying until properly and thoroughly cured.

10-13 SAMPLING OF PLASTER: Samples may be taken from plaster work in place, at any time, by the Contracting Officer. Areas represented by samples which show oversanding will be rejected.

10-14 PATCHING: Plaster containing cracks, blisters, pits, checks, or discoloration will not be acceptable. Such plaster shall be removed and replaced with plaster conforming to the requirements of this specification and approved by the Contracting Officer. Patching of defective work will be permitted only when approved by the Contracting Officer, and such patching shall match existing work in texture and color.

TILE WORK, CERAMIC: FOR FLOORS AND WALLS

11-01 SCOPE: The work covered by this section of the specifications consists in furnishing all plant, labor, equipment, appliances and materials, not furnished by the Government, and in performing all operations in connection with the installation of ceramic tile work for floors and walls, complete, in strict accordance with this section of the specifications and the applicable drawings, and subject to the terms and conditions of the contract.

11-02 APPLICABLE SPECIFICATIONS: The following specifications and publications, of the issues listed below but referred to thereafter by basic designation only, form a part of this specification:

a. Federal Specifications:

SS-C-192a	Cements; Portland
SS-L-351	Lime; Hydrated (for) Structural Purposes
SS-T-308	Tile, Ceramic; Floor, Wall and Trimmers
TT-C-598	Compound, Calking; Plastic (for Masonry and Other Structures)
UU-P-147a	Paper, Building, Waterproofed

b. U. S. Department of Commerce Publication:

R61-44	Simplified Practice Recommendation:
	Clay Tile for Floors and Walls
K300	Tile Manufacturers' Association, Inc., Basic Specification for Tile Work

11-03 GENERAL: All containers shall be delivered to the site with labels intact and seals unbroken. Containers shall not be opened until inspected by the Contracting Officer. Work required under this section of the specifications shall not be performed unless the ambient temperature of the area in which the work occurs is at least 40°F and rising.

11-04 MATERIALS:

a. Building Paper: Building paper shall conform to the requirements of Federal Specification UU-P-147a, Type 1, Class A.

b. Calking Compound: Calking compound shall conform to the requirements of Federal Specification TT-C-598.

c. Ceramic Mosaic Floor Tile: Tile for floor and bathtub shall be porcelain type, vitreous, ceramic mosaic tile, 1/4 inch thick with plain edges.

(1) Shape and Size: For all areas not otherwise specified, ceramic floor tile shall be laid as a straight line design.

(2) Colors: The color of ceramic tile shall be as indicated on the drawings and approved by the Contracting Officer.

d. Wall tile for facings and wainscots shall be nominal 4-inch squares, a minimum of 1/4 inch thick and shall have a non-vitreous body, glazed surface with a matte glaze finish. The colors of glazed wall tile shall be as indicated on the drawings and approved by the Contracting Officer.

e. Hydrated Lime: Hydrated lime shall conform to the requirements of Federal Specification SS-L-351, type M or type F, with the further requirement that the total free (unhydrated) calcium oxide (CaO) and magnesium oxide (MgO) in the hydrated product shall not exceed 8 percent by weight, calculated on the "as received" basis.

f. Portland Cement: Portland cement, including white cement, shall conform to the requirements of Federal Specification SS-C-192a, type 1.

g. Sand: Sand shall be clean, washed, sharp, durable, fine aggregate, free from silt, loam, clay, soluble salts, and organic impurities. Sand for setting beds of floors and base coats for wall shall be well-graded, passing a No. 8 sieve, with not more than 5 percent passing a 100-mesh screen. Sand for grout shall be screened to pass a 30-mesh sieve, with not more than 5 percent passing a 100-mesh screen.

h. Water: Water shall be clean and free from injurious amounts of oil, acids, soluble salts, and organic impurities.

11-05 SAMPLES: The following samples shall be submitted to the Contracting Officer for approval before proceeding with the tile work:

Two panels of floor tile about 12 inches square for each color.

Two panels of wall tile, four tiles to each panel, for each color to be used, showing the two extremes in color.

Two pieces of each of the tile shapes to be used.

One of each accessory specified.

11-06 INSTALLATION OF ERCCOR TILE: Floor tile operations occurring in spaces requiring both floor and wall tile shall not start until wall tile setting has been completed.

a. Laying Out Work: Prior to spreading the setting bed, the lines of borders, if any, shall be established, and the field work centered in both directions to permit the pattern to be laid with a minimum of cut tiles. Floors without borders shall be laid from the center lines outward and adjustments shall be made at the walls.

b. Installation of Setting Bed: The concrete subfloor shall be thoroughly cleaned and then moistened but not soaked, after which dry cement shall be sprinkled over the surface and the mortar for the setting bed shall be spread on the concrete, tamped to assure a good bond over the entire area, and screeded to provide a smooth and level bed. The thickness of the setting bed shall be such that the finished tile surfaces shall be to grade and line indicated on the drawings.

c. Setting-Bed Mortar: Setting-bed mortar shall be composed of one part portland cement and 3 parts sand, to which not more than 5 percent of hydrated lime, by volume of the cement, may be added, mixed with as little water as will produce a workable mass.

d. Laying Ceramic Mosaic Tile Floor: After the setting bed has set sufficiently to be worked over, dry cement shall be sprinkled over the surface and the tile laying begun. Straight edges shall be set to the lines established and be reset at suitable intervals to keep the joints parallel over the entire area. The sheets of ceramic mosaic tile shall be laid to the straight edges, with the joints between sheets the same as the joints between the tiles on the sheets, after which the tile shall be tamped solidly onto the bed, using wood blocks of such size as to ensure solid bedding free from depressions. The tile lay-out shall eliminate cut tile to the greatest extent possible. Fractional changes in dimensions without varying the uniformity of joint widths will be permitted. Where required, tile shall be cut with a suitable cutting tool and rough edges shall be rubbed smooth. Cut-tile misfits shall be replaced with properly cut tile.

e. Grouting: When the setting bed has hardened sufficiently, the paper sheets on ceramic mosaic tile shall be moistened and removed, and the joints completely filled with grout by screeding

and brushing the grout mix over the tile until the joints are thoroughly filled. All excess grout shall be removed. Not less than 48 hours shall elapse before ordinary foot traffic is permitted on the floor. Grout shall be mixed as follows: Grout for joints in ceramic mosaic tile shall be a thick soupy mix of neat cement. Grout for all joints over 1/8 inch in width shall be composed of one part cement to 2 parts sand, except that for joints 1/2 inch or more in width, the sand content may be increased to 2-1/2 parts, using a coarser well-graded sand.

11-07 INSTALLATION OF WALL TILE:

a. Scratch Coat: Scratch coat for application as a foundation coat shall be not less than 1/4-inch thick composed of one part cement to 3 parts sand, with the addition of 10 percent hydrated lime by volume of the cement used. While still plastic, the scratch coat shall be deeply scored or scratched and cross-scratched. The scratch coat shall be protected and kept reasonably moist during the seasoning period. All mortar for scratch and float coats shall be used within one hour after mixing. The rettempering of partially hardened mortar will not be permitted. The scratch coat shall be applied not more than 48 hours nor less than 24 hours before starting the setting of tile.

b. Float Coat: The float coat shall be composed of one part cement, one part of hydrated lime and 3-1/2 parts sand. The float coat shall be brought flush with screeds or temporary guide strips so placed as to give a true and even surface at the proper distance from the finished face of the tile.

c. Setting Wall Tile: Wall tile shall be thoroughly soaked in clean water before setting. Wall tile shall be set by troweling a skim coat of neat portland cement mortar on the float coat or applying a skim coat to the back of each tile unit and immediately floating the tile into place. Joints shall be straight, level, perpendicular, and of even width not exceeding 1/16 inch. Wainscots shall be built of full courses, which may extend to a greater height, but in no case more than 1-1/2 inches lower than the specified or figured height. Vertical joints shall be maintained plumb for the entire height of the tile work.

d. Grouting: All joints in wall tile shall be grouted full with a plastic mix of neat white cement immediately after a suitable area of tile has been set. The joints shall be tooled slightly concave and the excess mortar shall be cut off and wiped from the face of tile. Any interstices or depressions in the mortar joints after the grout has been cleared from the surface shall be roughened at once and filled to the line of the cushion-edge before the mortar begins to harden. Tile bases or coves shall be solidly backed with mortar. All joints between wall tile and plumbing or other built-in fixtures shall be made with a light-colored calking compound. Immediately after the grout has had its initial set, tile wall surfaces shall be given a protective coat of a noncorrosive soap or other approved method of protection.

e. Accessories: Porcelain-type accessories shall be installed in the approximate location indicated on the drawings, or where directed by the Contracting Officer. Recessed accessories where shown on drawings or specified in connection with plastered walls shall be neatly installed, and the plaster repaired around the accessories if required. The fixtures installed shall be equal to "Fairfacts" K6 set as follows in white, manufactured by The Fairfacts Company, Trenton 3, New Jersey.

For each bathroom the following:

- One 6" x 6" soap holder #F115
- One 6" x 6" tumbler holder #F160
- One 6" x 6" soap holder and grab bar #F152
- One 6" x 6" paper holder #F2 built-in
- Two 24 inch towel bars #F300

For each maid's toilet room by the same manufacturer "or equal":

- One $4\frac{1}{4}$ " x 6" soapholder #F114
- One $4\frac{1}{4}$ " x 6" tumbler holder #F164
- One 6" x $4\frac{1}{4}$ " paper holder
- One 24" towel bar #300

g. Calcking: Non-staining calcking compound shall be used at all joints between built-in fixtures and the tile work and at the top of ceramic tile bases, to insure a completely waterproof job. Internal corners shall be calcked prior to application of corner bead.

11-08 CLEANING: Upon completion, all tile floor and tile wall surfaces shall be thoroughly cleaned in a manner recommended by the manufacturer so as not to affect the glazed surface of the tile.

11-09 PROTECTION: Before foot traffic is permitted over finished tile floors, the floors shall be covered with building paper. Board walkways shall be laid on floors that are to be continuously used as passageways by workmen. Tiled floors to be trucked over shall have suitably constructed continuous plank runways of required width installed over the building paper. Cracked, broken, or damaged tiles shall be removed and replaced prior to final acceptance.

SECTION 12

FLOORING; ASPHALT TILE

12-01 SCOPE: The work covered by this section of the specification consists in furnishing all plant, labor, equipment, appliances, and materials, not furnished by the Government, and in performing all operations in connection with the installation of asphalt tile, complete, in strict accordance with this section of the specifications and the applicable drawings, and subject to the terms and conditions of the contract.

12-02 APPLICABLE SPECIFICATIONS: The following Federal Specifications, of the issues listed below but referred to thereafter by basic designation only, form a part of this specification:

P-W-151a Wax, Floor, Water-Emulsion.

SS-T-306a Tile; Asphalt

12-03 GENERAL: Asphalt tile shall be installed in the spaces indicated on the drawings. All materials shall be stored at a minimum temperature of 75 degrees F for at least 24 hours before installation. A temperature of at least 75 degrees F shall be maintained in the spaces where asphalt tile is being installed for at least 48 hours before, during and 48 hours after installation. Adequate ventilation shall be provided to take off moisture and volatile fumes. Unless otherwise specified, all materials and methods used shall be in strict accordance with the recommendations of the manufacturer of the asphalt tile. All materials shall be delivered to the job in the manufacturer's original unopened containers with the manufacturer's brand and name clearly marked thereon.

12-04 MATERIALS: Asphalt floor tile and base shall conform to the requirements of Federal Specification SS-T-306a, or shall be equal to the products of: Tile-Tex Corp., Sloane Blabon Corp., Johns-Mansville, or the Flint Kote Co., or any other approved American manufacturers.

a. Asphalt Floor Tile: Asphalt floor tile shall be 9-inch square by 1/8" thick. Color shall be as indicated on the drawings or as selected by the Contracting Officer.

b. Asphalt Base Tile: Base shall be sufficiently flexible to allow for slight irregularities in walls and partitions. Base shall be on top type cove, 4 inches high, and black color, unless otherwise specified.

c. Grease Resistance: In addition to the requirements of Federal Specification SS-T-306a, asphalt tile in kitchen areas shall be insoluble in all fats and greases and shall show no softening of the

surface after being totally immersed in grease for 24 hours at a temperature of 77 degrees F. After this test, acceptable tile will show no loosening of the surface from the tile body.

d. Primer: Primer shall be cut-back-type. Cut-back-type primer shall be a thin liquid composed of an asphaltic base and a suitable light volatile solvent, made specially for use with asphalt tile, and weighing approximately 10 pounds per gallon.

e. Cement: Cement shall be cut-back-type. Cut-back-type cement shall be composed of an asphaltic base and suitable volatile solvents made specially for use as an adhesive for bedding and fastening asphalt tile, and shall be of a heavy consistency that can be applied and effectively spread with a toothed trowel.

f. Wax: Wax shall conform to the requirements of Federal Specification P-W-151a.

g. Cove-Base Cement: Cove-base cement shall be a semi-waterproof cement of a type specially made for use in the application of asphalt-tile bases.

12-05 SAMPLES: Before purchase and/or delivery of material to the site, samples of all Contractor-furnished materials listed below shall be submitted to the Contracting Officer for approval:

Asphalt tile, 2
Asphalt base, 2
Primer, one quart
Cement, one quart
Cove-base cement, one pint

12-06 PREPARATION OF SUBFLOOR: Surfaces to receive asphalt tile shall be swept clean and shall be free from moisture, paint, oil and wax. Concrete floors shall have a smooth and even steel-troweled finish, and shall have any cracks, rough areas or other surface defects filled with plastic material.

12-07 INSTALLATION:

a. Priming Coat: A coat of cut-back-type primer shall be well worked into the surface of the concrete with stiff brushes or a straight-edged steel trowel using the minimum quantity that will assure covering the complete surface with an ~~unabsorptive base~~. Primer shall be allowed to become thoroughly dry, before application of other material.

b. Cement: The cement shall be applied to the floor with a notched steel trowel and allowed to set up until the surface is tacky (30 minutes to 3 hours). The notches in the trowel shall be not over 1/16 inch deep and spaced 3/16 inch on centers. The notches shall be maintained at the specified depth, and when reduced by wear, shall be removed with a fine V-spaped file.

c. Title: When the cement is sufficiently dry, the asphalt tile shall be installed. Tile shall be laid in such a manner that the entire under surface will be securely bonded in place. Tiles shall be tightly fitted so that each tile is in contact with the surrounding tiles and all joints are in proper alinement. The graining in alternate jasper or marbelized tiles, if selected, shall be reversed.

b. Base: The base shall be secured to the walls and partitions with cove-base cement. All joints shall be tight and the base throughout its entire length shall have its top and bottom edges in firm contact with the walls and floor.

12-08 CLEANING AND WAXING: The asphalt tile shall be thoroughly cleaned of all cement spots, dirt, and other soiling and shall be left in a condition satisfactory for waxing. Spots shall be removed by means of a putty knife and steel wool, or by a cloth moistened with a neutral soap of a type approved by the manufacturer of the asphalt tile. The use of solvents and wet mopping and washing is prohibited. After cleaning, apply one coat of wax and polish with a mechanical or hand buffer.

12-09 PROTECTION: After cleaning, the asphalt tile shall be properly protected until acceptance by a covering of heavy paper or non-staining sawdust, and by boardwalks in all areas where damage to the floor may occur because of subsequent building operation.

SECTION 13

GLASS AND GLAZING

13-01 SCOPE: The work covered by this section of the specifications consists in furnishing all plant, labor, equipment, appliances, and materials not furnished by the Government, and in performing all operations in connection with the installation of glass, complete, in strict accordance with this section of the specifications and the applicable drawings, and subject to the terms and conditions of the contract.

13-02 APPLICABLE SPECIFICATIONS: The following Federal Specifications, of the issues listed below but referred to thereafter by basic designation only, form a part of this specification:

DD-G-451a Glass; Flat (for) Glazing Purposes

TT-P-781a Putty and Elastic Compound; (for)
Metal-Sash-Glazing

13-03 MATERIALS:

a. Flat Glass: The following kinds of flat glass shall conform to the requirements of Federal Specification DD-G-451a, of types as noted.

(1) Clear Window Glass: Clear sheet glass, except where specified otherwise, shall be type II, A quality, nominal 7/32 inch thick.

(2) Obscure Glass: Obscure glass shall be type IIIc, glazing quality, rolled figured sheet, and shall be not less than 3/16 inch thick, with one surface smooth.

(3) Polished Plate Glass shall be type I, glazing quality. Nominal thickness 1/4 inch.

b. Putty: Putty for sash glazing shall conform to the requirements of Federal Specifications TT-P-781a for metal sash, and shall be of a type most suitable for the purpose.

13-04 SAMPLES: Samples of all glass and mirror, size 10" x 12" shall be submitted to the Contracting Officer for inspection and approval prior to purchase and delivery of material, to site.

13-05 GENERAL: The sizes of glass indicated on drawings are approximate only, and the actual sizes required shall be determined by measuring the frames to receive the glass. All glass shall be factory-labeled on each pane and labels shall not be removed until final approval. The types of glass to be installed at various locations shall be as follows:

- a. Clear Window Glass: Clear sheet glass shall be used throughout, except as indicated otherwise on the drawings or as specified here below.
- b. Obscure Glass: Obscure glass shall be used for glazing the windows in toilet rooms.
- c. Plate glass shall be used in doors where required.

13-06 INSTALLATION: Sashes shall be fixed so that they cannot be moved until putty or glazing compound has set. Glass in metal frames shall be secured with glazing clips. Obscure glass shall be set with the smooth surface to the exterior and with the surface design on one direction.

13-07 ACCEPTANCE: Glass shall be protected against damage. After inspection, labels and paint smears and spots shall be removed from the glass and the glass shall be washed clean. Damaged or broken glass shall be removed and replaced before acceptance, at no expense to the Government.

SECTION 14

PAINTING; PROTECTIVE, ON METAL

14-01 SCOPE: The work covered by this section of the specifications consists in furnishing all plant, labor, equipment, appliances and materials, not furnished by the Government, and in performing all operations in connection with protective painting on metals, complete, subject to the terms and conditions of the contract, and in strict accordance with this section of the specifications and the applicable drawings.

14-02 APPLICABLE SPECIFICATIONS: The following Federal Specifications form a part of this specification:

TT-P-20	Paint, Blue-Lead-Base; Basic Sulphate, Linseed-Oil, Ready-Mixed
TT-P-31a	Iron-Oxide, Ready-Mixed and Semi-Paste, Red and Brown
TT-P-86a	Paint, Red-Lead-Base; Linseed-Oil Ready- Mixed

14-03 GENERAL: Unless otherwise specified, all exterior and interior ferrous metal except reinforcing steel, bolts, rough hardware, and metal with non-ferrous coatings shall be given a shop coat of protective paint. Paint shall conform to the requirements of paragraph on MATERIALS below, or subject to the approval of the Contracting Officer, may be a baked-on shop coat of rust-inhibitive paint of a type standard with the manufacturer, provided such shop coat has proved performance characteristics at least equal to those of the materials specified herein.

14-04 MATERIALS:

a. Exterior Type Paint: Paint for exterior metal shall conform to the requirements of Federal Specification TT-P-20 or TT-P-86a.

b. Interior Type Paint: Paint for interior metal shall conform to the requirements of Federal Specification TT-P-20, TT-P-31a, or TT-P-86a.

14-05 APPLICATION: Surfaces to be painted shall be thoroughly cleaned of scale, dirt and rust by the use of steel scrapers, wire brushes, sand blast, or other equally suitable tools or methods. Oil and grease shall be removed with benzine or other suitable solvent. Paint shall be kept well stirred while it is being applied. No paint shall be used after it has caked or hardened. Paint shall be well worked into all joints and corners. Paint shall not be applied to damp surfaces.

SECTION 15

PAINTING: GENERAL

15-01 SCOPE: The work covered by this section of the specifications consists in furnishing all plant, labor, equipment, appliances and materials, not furnished by the Government, and in performing all operations in connection with painting and finishing, exclusive of protective painting of metal surfaces, complete, in strict accordance with this section of the specifications and the applicable drawings, and subject to the terms and conditions of the contract.

15-02 APPLICABLE SPECIFICATIONS: The following Federal Specifications, of the issues listed below but referred to thereafter by basic designation only, form a part of this specifications:

TT-A-468a	Aluminum Pigment; Powder and Paste (for) Paint
TT-C-595	Colors; (for) Ready-Mixed Paints
TT-D-651b	Drier, Paint, Liquid
TT-E-508	Enamel; Interior, Semi-Gloss, Tints and White
TT-F-336a	Filler; Wood, Paste
TT-O-364	Oil; Linseed, Boiled
TT-O-369	Oil; Linseed, Raw
TT-P-21	Paint; Exterior, Cement, Water; Type II
TT-P-25a	Paint; Exterior-Primer, Ready-Mixed, White (Undercoat for Wood)
TT-P-29	Paint; Latex Base, Interior Flat, White & Tints
TT-P-56a	Paint; Primer-Sealer, (for Plaster and Wallboard)
TT-P-104	Paint; (White Lead and Oil Exterior, Ready Mixed, White and Light Tints)
TT-P-141b	Paint; Varnish, Lacquer and Related Materials; Methods of Inspection, Sampling and Test
TT-P-641a	Primer; Paint; Zinc Dust-Zinc Oxide (for Galva- nized Zinc-Coated or Zinc Surfaces)
TT-P-791a	Putty; Pure-Linseed-Oil, (for) Wood-Sash-Glazing
TT-T-291a	Thinner; Paint, Volatile Mineral Spirits (Petro- leum-Spirits)
TT-T-306	Thinner; Synthetic-Enamel
TT-T-801	Turpentine; Gum Spirits and Wood (Steam-Distilled and Sulphate) (for Use in Organic Coatings)
TT-T-806	Turpentine; Wood (Destructively-Distilled) (for Use in Organic Coatings)
TT-V-51a	Varnish; Asphalt
TT-V-71d	Varnish; Interior
TT-V-81b	Varnish; Mixing (for) Aluminum Paint
TT-V-91b	Varnish; Shellac
TT-V-121c	Varnish; Spar, Water-Resisting

15-03 GENERAL: The term "paint", as used herein, includes emulsions, enamels, paints, stains, varnishes and sealers. All paints, accessory materials and colors shall be subject to the approval of the Contracting Officer.

15-04 MATERIALS: Paint shall be well-ground, shall not settle badly, cake or thicken in the container, shall be readily broken up with a paddle to a smooth consistency, and shall show easy brushing properties. The paint shall be suitable for spraying when thinned with not more than 12 percent by volume of mineral spirits. Except as otherwise specified or directed by the Contracting Officer, the colors of paints shall conform to the requirements of Federal Specification TT-C-595. All paint materials shall be delivered to the job in original, unbroken containers, with labels and tags intact. Both primer and finish paints shall contain a fungicide. Phenol mercuric salicylate in the amount of one percent or mercurio chloride in the amount of 1.5 percent, based on the total weight of the paint, will be acceptable. Each package of ready-mixed paint intended for use shall have added thereto the aforementioned fungicide or any kind of approved fungicide, and shall have an additional separate label verifying the addition of fungicide.

a. Aluminum Paint: Aluminum paint shall consist of aluminum pigment conforming to the requirements of Federal Specification TT-A-468a, type II, class A or B as best suited to the end use, mixed with aluminum-paint-mixing varnish conforming to the requirements of Federal Specification TT-V-81b, type II, class B, in the proportion of 2 pounds of pigment to 1 gallon varnish.

b. Asphalt Varnish: Asphalt varnish shall conform to the requirements of Federal Specification TT-V-51a.

c. Exterior Oil Paint: Exterior oil paint shall conform to the requirements of Federal Specification TT-P-104, type I, class A or C, as required by the tint to be used.

d. Cement Water Paint: Cement water paint shall be a water repellent and dampproofing type, conforming to all the requirements of Federal Specification TT-P-21, type II.

e. Interior Semi-Gloss Enamel: Interior semi-gloss enamel paint shall be wall paint conforming to the requirements of Federal Specification TT-E-508.

f. Latex Base Paint: Latex base paint shall conform to the requirement of Federal Specification TT-P-29.

g. Primer Paint:

(1) Exterior Primer Paint: Exterior primer shall conform to the requirements of Federal Specification TT-P-25.

(2) Interior-Primer-Sealer Paint: Interior-primer-sealer paint shall conform to the requirements of Federal Specification TT-P-56.

(3) Zinc Dust-Zinc Oxide Primer: Zinc dust-zinc oxide primer shall conform to the requirements of Federal Specification TT-P-641, type and class at the option of the Contractor.

h. Putty: Putty shall conform to the requirements of Federal Specification TT-P-791a, type II.

i. Varnish:

(1) Interior Varnish: Interior varnish shall conform to the requirements of Federal Specification TT-V-71b.

(2) Shellac Varnish: Shellac varnish shall conform to the requirements of Federal Specification TT-V-91a, of the type and grade best suited to the end use.

(3) Spar Varnish: Spar varnish shall conform to the requirements of Federal Specification TT-V-121c.

j. Wood Filler: Wood filler shall conform to the requirements of Federal Specification TT-F-336a.

k. Miscellaneous Paint Materials:

(1) Color Pigments: Color pigments shall be pure, non-fading and finely ground.

(2) Drier, Liquid: Liquid drier shall conform to the requirements of Federal Specification TT-D-651a, type I, except that type II shall be used with lead-free paint.

(3) Linseed Oil: Raw linseed oil shall conform to the requirements of Federal Specification TT-O-369. Boiled linseed oil shall conform to the requirements of Federal Specification TT-O-364.

(4) Thinner: Thinner for oil paint shall conform to the requirements of Federal Specification TT-T-291a, grade 1. Thinner for synthetic enamel shall conform to the requirements of Federal Specification TT-T-306.

(5) Turpentine: Turpentine shall conform to the requirements of Federal Specification TT-T-801 or TT-T-806.

15-05 SAMPLES AND TESTS: Samples of each type of Contractor-furnished paint and each color proposed for use shall be submitted to the Contracting Officer, and approval thereof received before the material represented by the samples is used on the project. Samples shall consist of 1 pint of each kind of paint, and 3 displays of each type and color of paint applied to wood strips 2 inches by 6 inches. Wood used to display stains shall be the same kind as that on which the stain is ultimately to be applied. In addition to the submission of samples, the Contractor shall submit for approval of the Contracting Officer authenticated reports of tests, chemical analysis and proof of past performance of the materials proposed for use. Tests shall be in accordance with the requirements of Federal Specification TT-P-141b.

15-06 PREPARATION OF SURFACES AND APPLICATION OF PAINT:

a. General: Hardware, hardware accessories, plates, lighting fixtures and similar items in place prior to painting, shall be removed during painting operations and repositioned upon completion of each space, or shall be otherwise protected. Equipment adjacent to walls shall be disconnected by workmen skilled in these trades and moved to permit the wall surfaces to be painted, and following completion of painting, shall be replaced and reconnected. Except as otherwise specified, all surfaces to be painted shall be clean, smooth, dry, and free from dust and grit. All work shall be done in a workmanlike manner, leaving the finished surfaces free from drops, ridges, waves, laps, and brush marks. Paint shall be applied under dry and dust-free conditions. All primer and intermediate coats of paint shall be unscarred and completely integral at the time of application of each succeeding coat. Each coat of paint shall have a slight variation of color to distinguish it from the preceding coat. Sufficient time shall be allowed between coats to ensure proper drying. Paints shall be thoroughly stirred and kept at a uniform consistency during application and shall not be thinned in excess of the printed directions of the manufacturer. All special directions or specifications of the manufacturer as to surface preparation, application of paint, and equipment thereof, shall be observed and complied with unless otherwise specified herein. Care shall be exercised during spraying to hold the nozzle sufficiently close to the surfaces being painted to avoid excessive evaporation of the volatile constituents and loss of material into the air, or the bridging over of crevices and corners. Spray equipment shall be equipped with mechanical agitators, pressure gages and pressure regulators. Nozzles shall be of proper size. Surfaces which have been cleaned, pretreated, and/or otherwise prepared for painting shall be primed as soon as practicable after such preparation has been completed, but in any event prior to deterioration of the prepared surface. Where painting on any type of surface has been commenced on any portion of the work, the complete painting operation, including priming and finishing coats, on that portion of the work, shall be completed as soon as practicable, without prolonged delays. Unless otherwise specified, sufficient time shall elapse between successive coats to permit them to dry for recoating, and this minimum drying period shall be modified as necessary to suit adverse weather conditions. At all times prior to final acceptance of the work, all coats of all painted surfaces shall be unscarred and completely integral at the time of application of all succeeding coats, and the opinion of the Contracting Officer, it becomes necessary, the integrity and continuity of all coats shall be reestablished by retouching or repainting, using paints identical with those being maintained. At the time of application of each successive coat, undercoats shall be freed of dust, grease or any foreign matter, which might adversely affect intercoat adhesion, by means of air blast, solvent wiping or other approved means. Paint may be applied by brush except when, in the opinion of the Contracting Officer, brushing in any particular application would produce unsatisfactory results. Floors, roofs and other adjacent areas and installations shall be satisfactorily protected by drop cloths or other precautionary measures.

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Metal doors shall be kept clean and free from corrosion following installation. Abraded surfaces shall be re-touched prior to finish paint, using the same type of paint as the priming coat.

c. Concrete, Shotcrete, Plaster, and Masonry Surfaces: Unless otherwise authorized or directed by the Contracting Officer, no paint shall be applied to concrete, shotcrete, plaster, and masonry surfaces less than 60 days old. Prior to painting, all such surfaces shall be prepared by removing all dirt, dust, efflorescence, oil and grease stains, or other foreign substances by wire or fiber brushing, scrapers, light sandblasting, and/or other approved means and by surface roughening, when necessary, to provide good adhesion of paint. Cracks and holes shall be repaired with approved patching materials, properly keyed to the existing surfaces and sandpapered smooth. Surfaces to be painted with cement-water paint shall be thoroughly dampened with a fine spray of water before application of the paint. The interval between coats shall not be less than 24-hours, and the first coat shall be slightly dampened before the application of the second coat. The paint shall be applied with a stiff brush, and thoroughly worked into the surface to seal all pores, cracks, and voids. The paint shall be cured by wetting the surface between coats, and at intervals for a period of not less than 2-days after the application of the finish coat. Surfaces to be painted with latex base paint shall be prepared in accordance with the recommendations of the paint manufacturer.

d. Woodwork: All millwork and all other woodwork, where required, shall be sandpapered before application of the primer. Small, dry, seasoned knots shall be thoroughly cleaned and scraped, and shall be given a thin coat of orange shellac varnish before the priming coat is applied. Large, open, unseasoned knots and all beads or streaks of pitch shall be heated by a blowtorch and then scraped off, or if the pitch is still soft, it shall be removed with mineral spirits or denatured alcohol. Resulting voids, if any, shall be filled with putty. Nails shall be set. Painting shall proceed only when, in the opinion of the Contracting Officer, the wood is satisfactorily dry.

(1) Priming: All millwork to be painted shall be primed on all sides before installation, with particular attention being given to the sealing of cross-grained surfaces. Woodwork other than millwork shall be primed on exposed surfaces only.

(2) Puttying and Glazing: After the priming coat has been applied, nail holes, cracks, and other depressions shall be filled flush with putty colored to match the finish coat, and sandpapered smooth. Putty shall be dry before subsequent painting.

15-07 EXTERIOR PAINTING:

a. Ferrous Metalwork: Exterior ferrous metal surfaces shall be painted two coats of exterior oil paint over the protective paint to match the adjacent work.

b. Copperwork: Copper surfaces, except as otherwise specified or indicated on the drawings, shall be thoroughly cleaned with mineral spirits or other hydrocarbon solvent followed by one primer of aluminum paint followed by two coats of exterior oil paint to match adjacent work.

c. Concrete, Shotcrete and Masonry: Concrete, shotcrete and masonry surfaces shall be painted with two (2) finish coats of exterior type cement water paint conforming to Federal Specification TT-P-21, type II. Unless otherwise directed, all coats shall be brush applied strictly in accordance with the manufacturer's directions, with proper attention being paid to dampening of masonry, shotcrete or concrete surfaces prior to start of application as well as use of water spray during curing period of each application. This procedure must be adhered to, in order to properly cure each application of cement water paint. Failure to observe these instructions will produce a finish which will chalk or dust off, thereby providing a surface which is incapable of receiving or holding further application of wall finish or paint.

15-08 INTERIOR PAINTING, BASE COATS, AND SPECIAL TREATMENTS:

a. General: Interior areas noted on the drawings to be painted shall include all wood, metal, plaster and similar surfaces. Horizontal runs of overhead pipes and pipe covering shall be painted the same colors as ceilings. Vertical pipe and pipe covering shall be painted with the same colors as walls. Concealed pipings shall be left unpainted.

b. Wood Surfaces: Wood surfaces, except surfaces to be given natural finish or other finish specified, shall be painted one coat of primer-sealer paint followed by two finish coats of interior semi-gloss enamel.

c. Metal Surfaces: Metal surfaces shall be treated as follows:

(1) Ferrous Metal: Ferrous metal surfaces, except as otherwise specified, or indicated on the drawings, shall be painted with protective paint as specified in section on PAINTING; PROTECTIVE ON METAL, followed by two coats of interior oil paint of color to match adjacent surfaces.

(2) Galvanized Metal: Galvanized metal surfaces shall be thoroughly cleaned with mineral spirits or other hydrocarbon solvent and then given a priming coat of zinc-dust oxide paint followed by finish paint to match adjacent surfaces.

d. Concrete, Masonry and Plaster Surfaces: Prepared concrete, masonry and plaster surfaces shall be given two (2) coats of latex base paint, reinforced, conforming to the requirements of Federal Specification TT-P-29 which shall be applied by roller application in strict accordance with manufacturers' instructions. NOTE - No oil base primer or undercoater shall be used in conjunction with latex base paints, under any condition. Sufficient drying time shall be allowed between coats, preferably 12 to 18 hours.

e. Pipe Covering: Pipe covering shall be given a heavy coat of approved glue size, followed by one coat of interior oil paint to match adjacent finish.

f. Buried Piping: All steel piping and exposed threads of galvanized piping, where run in or through concrete or masonry, or buried underground, shall be given one coat of an approved asphalt varnish.

15-09 COLOR SCHEDULE: The painting and finishing of all exterior and interior surfaces of the buildings shall be as hereinbefore specified unless otherwise directed by the Contracting Officer. The color schedule for the various spaces shall be as indicated on the drawings and approved by the Contracting Officer. All colors shall conform to the color tone without regard to designation as gloss, semi-gloss or lusterless.

15-10 CLEANING: All cloths and cotton waste which might constitute a fire hazard shall be placed in metal containers or destroyed at the end of each work day. Upon completion of the work, all staging, scaffolding, and containers shall be removed from the site or destroyed in a manner approved by the Contracting Officer. Paint spots, oil, or stains upon adjacent surfaces shall be removed and the entire job left clean and acceptable to the Contracting Officer.

SECTION 16

HARDWARE: BUILDERS'

16-01 SCOPE: The work covered by this section of the specifications consists in furnishing all labor, equipment, appliances and materials not furnished by the Government, and in performing all operations in connection with the installation of builders' hardware, complete, in strict accordance with this section of the specifications and the applicable drawings, and subject to the terms and conditions of the contract.

16-02 APPLICABLE SPECIFICATIONS: The following Federal Specifications form a part of this specification:

FF-H-106a	Hardware, Builders; Locks and Lock-Trim
FF-H-111a	Hardware, Builders; Shelf and Miscellaneous
FF-H-116b	Hardware, Builders; Hinges, Non-Template

16-03 GENERAL: All doors and other movable parts of the building shall be equipped with hardware as specified herein or as shown on the drawings. If the hardware for any particular location is not described herein, it shall be provided and shall be like that for similar locations as near as is practicable. If no similar locations are specified, such hardware shall be of plain, heavy pattern, suitable type and ample size for the service required. Unless otherwise specified, hardware shall conform to the requirements of Federal Specifications mentioned above. Where the exact types of hardware specified are not adaptable to the finished shape or size of members requiring the hardware, suitable types, having as nearly as practicable the same operations and quality as the types specified, shall be furnished. Where manufacturers' products are specified, the products of other manufacturers, equal to the product specified, and approved by the Contracting Officer, may be used. All modifications in hardware, required by reason of construction characteristics, shall be such as to provide the specified operative or functional features. Hardware for application on metal shall be made to standard templates.

16-04 HARDWARE TYPES: All hardware shall be of approved American Manufacture.

a. Butt Hinges for Swinging Doors (Other than Kitchen Cabinets): Butt hinges for exterior doors opening out shall be furnished with fixed pins.

(1) Butt hinges for all doors shall be type 2005 $\frac{1}{2}$, unless otherwise specified, and except for screen doors.

(2) Hinges for screen doors shall be type 2301A.

(3) Where the projection of the door trim is such as to prevent clearance with the butt hinges specified, butt hinges with leaves of sufficient width to clear the trim shall be provided.

(4) Butt Hinges Per Door: Provide 3 hinges for each door 4 $\frac{1}{2}$ " X 4 $\frac{1}{2}$ " for exterior doors, 3 $\frac{1}{2}$ " X 3 $\frac{1}{2}$ " for interior doors.

b. Floor Hinges: Floor hinges shall be type 233 $\frac{1}{4}$.

c. Door Pulls: Door pulls shall be type 1275, unless otherwise specified.

d. Door Silencers: Door silencers shall be type 1337A. Three silencers shall be provided for each pressed steel frame for single doors.

e. Door Stops, type 1321E, shall be supplied wherever an item of hardware of an opened door might contact a wall or other part of the building construction. Where the wall type stop cannot be used to practical advantage, type 1329E floor stops, shall be supplied.

f. Surface bolts shall be type 1061, 6 inch. Strikes for threshold shall be furnished with machine screws.

g. Locks and Latches: Mortise locks and latches shall be series 161 as hereinafter scheduled.

h. Push Plates: Push plates shall be type 465R.

i. Barrel Bolts: Barrel bolts shall be type 1011, 3 inches long.

16-05 SAMPLE SCHEDULE AND SAMPLES: As soon as practicable after award of contract, and before a hardware schedule is prepared, or any hardware purchased and delivered to the project site, the Contractor shall submit to the Contracting Officer, for approval, a sample schedule in quintuplicate, listing each of the different items of builders' hardware required. The sample schedule shall be submitted in this form:

ITEM NO.:	SPECIFICATION REFERENCE:	:	NAME OF ITEM	:	MFR'S NAME & CATALOG
		:		:	
		:		:	
		:		:	

Opposite each listed item number, insert the specification reference, the name of the item and the manufacturer's name and catalog number of the item to be supplied. Where the listed item is not a Federal Specification type, and is not illustrated in the manufacturer's catalog, a cut and description, or shop drawings shall be submitted with the hardware schedule. In addition to the sample schedule, a sample of each different item of builders' hardware, properly tagged and marked for identification, shall be submitted to the Contracting Officer for approval. Following approval of the sample schedule and samples by the Contracting Officer, a permanent schedule of hardware, showing the quantities, types, and locations of the various items of builders' hardware required for the project, shall be delivered, in duplicate, to the Contracting Officer for the record file. The permanent schedule shall contain only the catalog numbers of the items appearing on the approved sample schedule.

16-06 FINISHES: All finishes shall conform to the requirements of Federal Specification FF-H-106a.

a. Dull Bronze (US10): All hardware except in toilets and kitchens.

b. Chromium Plated (US26) With Satin Finish: Hardware in toilets and bathrooms. Chromium plating shall be applied to nickel coatings.

16-07 KEYS AND KEYING: All locks shall have two keys with the lock number stamped upon them with the corresponding number stamped upon the face of the lock. Locks of outside doors in the same building shall be keyed alike, but differently from the doors in any other building. Locks shall be masterkeyed as directed by the Contracting Officer. Six (6) keys shall be provided for each master-keyed set. Upon receipt of keying information, the Contractor shall submit for approval five full and complete keying schedules. Two copies will be returned for use of the Contractor. After all locks have been installed and upon completion of the work, the keys shall, in the presence of the Contracting Officer, be shown to operate their respective locks and shall be tagged and delivered to him.

16-08 APPLICATION OF HARDWARE:

a. Hinges: Hinges shall be installed in accordance with standard practice and as directed by the Contracting Officer. Suggested rules for locating butt hinges on a door are as follows:

(1) 5-inch distance from jamb rabbet to top edge of top butt hinge.

(2) 10-inch distance from finished floor line to bottom edge of bottom butt hinge.

(3) Center butt hinge to be evenly spaced between other two butt hinges.

(4) $\frac{1}{4}$ -inch distance from edge of door to edge of butt hinge mortise for doors up to $2\frac{1}{4}$ -inches in thickness.

b. Door Pulls: Door pulls, where required, shall be installed so that the middle of the grip will be 44 inches above the finish floor.

c. Surface Bolts: Surface bolts, shall be installed on the face of the door and located at the center of the stile of the inactive door. Strikes located in metal thresholds shall be secured with machine screws, or by welding or brazing.

d. Locks and Latch Strikes: Locks and latch strikes, where required, shall be installed on doors and door frames at the same height from the floor throughout the building or buildings. The center of door knobs shall be 38 inches above the finish floor.

e. Push Plates: Push plates, where required, shall be installed so that the bottom of the plate will be 40 inches above the finish floor.

f. Other Hardware: Other hardware not mentioned herein shall be installed in accordance with standard practice and as directed by the Contracting Officer.

16-09 KEY CONTROL SYMBOL: The required hardware for each door in [REDACTED] is noted on the drawings by a symbol consisting of the hardware set number preceded by the letters "H", such as HW-1. The required hardware for each door in [REDACTED] shall be as hereinafter specified. Type numbers refer to Federal Specification numbers.

25X1A

25X1A

16-10 HARDWARE SETS: Following is the list of hardware sets:

a. For [REDACTED]

25X1A

HW-1

HW-2

Butts as required
Lockset Schlage D51PD CAM 10
1 Stop
Weatherstrips as detailed

Butts as required
Lockset: Schlage D51PD CAM 10
2 Surface Bolts
Weatherstrips as detailed.

HW-3

HW-4

1 Floor hinge
2 Push Plates

Butts as required
Latchset: Schlage A10S PLX 10
1 Stop

HW-5

Butts as required
Lockset: Schlage A40S FLY 10x26
1 Stop

HW-7

Butts as required
1 Door pull
1 Barrel bolt

25X1A

b. [REDACTED]

HW-6

Butts as required
Lockset: Schlage A10S FLY 10
1 Stop

(1) For Doors D/1, D/4 & D/6 (Exterior Doors):

Butts as required
Lockset - D61PD BAM-10 Schlage
Stop
Weatherstrips as detailed

(2) For Doors D/2 (Bedroom Doors):

Butts as required
Lockset - A10S FLY 10 Schlage
Stop

(3) For Door D/2 (Between Living Room & Kitchen):

Floor Hinge
2 Push Plates

(4) For Doors D/2 (Bathroom Door) & D/3 (Maid's Toilet Door):

Butts as required
Lockset - A40S FLY 10x26 Schlage
Stop

(5) For Door D/3 (Linen Closet Door):

Butts as required
Lockset - A10S FLY 10 Schlage
Stop

(6) For Door D/7 (Heater Room Door):

Butts as required
Lockset - A80PD FLY 10 Schlage
Stop

(7) For Doors L./

(7) For Doors CD/1 & CD/2 (Wardrobe Closet Doors):

Hinges - Type 2017 $\frac{1}{2}$ - 3" x 3" (3 hinges for each door CD/1 & 2 hinges for each door CD/2)
Catches - Type 1070 (2 for each door)
Door Pull - Type 1275 (one for each door)

16-11 MIDWINTERHOUSE:

a. Sliding Doors:

Track - Knappe & Vogt #470 - lengths as required.
2 Sheaves per door - Knappe & Vogt #427D
1 Pull each door #1213
4 Door Silencers each door #1337B
Bronze metal guides as noted.

b. Kitchen Cabinets:

Hinges Type 2017 $\frac{1}{2}$ - 2 $\frac{1}{2}$ " - two for each door.
Catch Type 1070 - One for each door.
Drawer Pulls Type 1306 - One for each drawer less
Than 20 inches wide; two for each drawer over 20
inches wide; one for each door.

SECTION 17

INTERIOR PLUMBING

17-01 SCOPE: The work covered by this section of the specifications consists in furnishing all plant, labor, equipment, appliances and materials not furnished by the Government, and in performing all operations in connection with plumbing, including all items of special equipment specified herein, complete, in strict accordance with this section of the specifications and the applicable drawings, and subject to the terms and conditions of the contract.

17-02 APPLICABLE SPECIFICATIONS: The following specifications and standards, of the issues listed below but referred to thereafter by basic designation only, form a part of this specification:

a. Federal Specifications:

O-S-602	Sodium Hypochlorite
HH-G-536	Compound; Plumbing-Fixture-Setting
HH-G-116	Gaskets; Plumbing-Fixture-Setting
HH-I-551a	Insulation; Glass, Cellular
HH-I-561c	Insulation; Thermal Asbestos
HH-P-117	Packing; Jute, Twisted
HH-P-387	Pipe Covering; Mineral Wool
QQ-C-502	Copper; Bars, Rods and Shapes
QQ-L-156	Lead; Calking
QQ-L-201	Lead; Sheet
WW-N-351	Nipples, Pipe; Brass, Steel and Wrought-Iron
WW-P-351	Pipe; Brass; Seamless; Iron-Pipe Size Standard and Extra-Strong
WW-P-401	Pipe and Pipe-Fittings; Soil, Cast-Iron
WW-P-406	Pipe; Steel and Ferrous Alloy (for) Ordinary Uses (Iron-Pipe Size)
WW-P-460	Pipe-Fittings; Bronze (Screwed), 125-Pound and 250-Pound
WW-P-491a	Pipe-Fittings; Cast-Iron, Drainage
WW-P-521b	Pipe-Fittings; Malleable Iron (Screwed) 150-Pound
WW-P-541a	Plumbing Fixtures; (for) Land Use
WW-P-542a	Plumbing Fixtures; (for) Land Use (Formed-Metal Plumbing Fixtures)
WW-T-797	Tubing; Copper, Seamless (for General Use with I.P.S. Flanged Fittings)
WW-T-799a	Tubing, Copper, Seamless (for Use with Solder-Joint or Flared-Tube Fittings)
WW-U-516	Unions; Brass or Bronze, 250-Pound
WW-U-531	Unions; Malleable-Iron or Steel, 250-Pound

17-01

- WW-V-51a Valves, Bronze; Angle, Check and Globe, 125- and 150-Pound, Screwed and Flanged (for Land Use)
- WW-V-54 Valves, Bronze, Gate; 125- and 150-Pound, Screwed and Flanged (for Land Use)
- WW-V-58 Valves, Cast Iron, Gate, 150- and 250-Pound, Screwed and Flanged
- GCG-P-351a Pipe-Threads; Taper (American National)

b. U. S. Department of Commerce Commercial Standards:

- CS111-13 Plumbing Fixtures, Earthenware (Vitreous-Glazed)

17-03 GENERAL: The drawings indicate the general arrangement of the plumbing. Details of proposed departures due to actual field conditions or other causes shall be submitted to the Contracting Officer for written approval. The Contractor shall carefully examine the drawings and shall be responsible for the proper fitting of materials and equipment in each building as indicated, without substantial alteration.

a. Standard Products: Equipment and materials to be furnished under this specification shall be the standard products of approved American manufacturers. Where two or more units of the same class of equipment are required, these units shall be products of a single manufacturer; however, the component parts of the system need not be the products of the same manufacturer.

b. Workmanship: All equipment, valve, pipe, fittings and material shall be installed in accordance with the recommendations of the manufacturer and the best standard practice.

c. Utilities: Water and drainage piping shall be extended to points outside the building as shown on the drawings, where the pipes shall be capped or plugged and left ready for future connection by others. If trenches are closed or the pipes are otherwise covered before being connected to the street mains, the location of the end of each plumbing utility shall be marked with a stake or by other acceptable means. Building service stub-out locations shall be approved by the Contracting Officer before laying pipe.

d. Cross Connections and Interconnections: No plumbing fixture, device or piping shall be installed which will provide a cross connection or interconnection between a distributing supply for drinking or domestic purposes and a polluted supply such as a drainage system or a soil or waste pipe which will permit or make possible the backflow of sewage, polluted water or waste into the water-supply system. Where it is necessary to cross a sewer line with a water line a 1 ft. minimum clearance between lines shall be maintained and the sewer line shall be cast-iron soil pipe for a minimum of 10 feet each side of the crossing.

e. Specifications: Materials required which are not covered by the detailed specifications shall meet the requirements of specifications listed hereinbefore and the items specified on the drawings and shall be of the required class, grade and type. Shop tests of pipe, valves and fittings, required by Federal Specifications to be conducted in the presence of a Government inspector, are waived.

f. Connections to Equipment and Fixtures Furnished by the Government or Specified Elsewhere: The Contractor shall provide all necessary material and labor to connect to the plumbing system, all fixtures and equipment having plumbing connections and which are furnished by the Government, if any, or are specified in other sections of these specifications.

g. Drawings: The drawings show the general arrangement of all piping; however, where local conditions necessitate a rearrangement, the Contractor shall prepare, and submit for approval, drawings of the proposed rearrangement. Because of the small scale of the drawings, it is not possible to indicate all offsets, fittings and accessories which may be required. The Contractor shall carefully investigate the structural and finish conditions affecting all his work and shall arrange such work accordingly, furnishing such fittings, traps, valves and accessories as may be required to meet such conditions. Invert elevations shall be checked and approved by the Contracting Officer before laying drain piping.

h. Shop Drawings: As soon as practicable after the award of contract and before purchase, fabrication or installation of equipment, complete control wiring diagrams and shop drawings of all major items of equipment shall be submitted to the Contracting Officer for approval.

i. Cutting and Repairing: The work shall be carefully laid out in advance, and any cutting of construction shall be done only with the written permission of the Contracting Officer. Cutting shall be carefully done and damage to buildings, piping, wiring or equipment as a result of cutting for installation shall be repaired by skilled mechanics of the trade involved, at no additional expense to the Government.

j. Protection of Fixtures, Materials and Equipment: Pipe openings shall be closed with caps or plugs during installation. Fixtures and equipment shall be tightly covered and protected against dirt, water and chemical or mechanical injury. At the completion of the work the fixtures, materials and equipment shall be thoroughly cleaned and delivered in a condition satisfactory to the Contracting Officer.

17-04 LIST OF MATERIALS, FIXTURES AND EQUIPMENT: Within thirty (30) days after award of contract and before any materials, fixtures or equipment are purchased, the Contractor shall submit to the Contracting Officer for approval, a complete list, in triplicate, of Contractor-furnished materials, fixtures and equipment to be incorporated in the

work, together with the names and addresses of the manufacturers and their catalog numbers and trade names. The Contractor shall also furnish other detailed information, when so directed by the Contracting Officer. No consideration will be given to partial lists submitted from time to time. Approval of materials will be based on manufacturers' published ratings. Any materials, fixtures and equipment listed which are not in accordance with the specification requirements may be rejected, and the Contracting Officer shall then have the right to select materials, fixtures and equipment therefor. All fixtures, valves, fittings and equipment shall be of American manufacture. If the Contractor fails to submit for approval within the specified time, or any authorized extension thereof, a list of materials and equipment hereinbefore specified, the Contracting Officer shall select a complete line of materials and equipment. The selection thus made by the Contracting Officer shall be final and binding and the items shall be furnished and installed by the Contractor without change in contract price or time of completion.

17-05 EXCAVATING, TRENCHING AND BACKFILLING:

a. Excavating and Trenching: Trenches for all underground pipe lines shall be excavated to the required depths. The bottoms of trenches shall be tamped hard and graded to secure the required fall. Bell holes shall be excavated so that pipe will rest on solid ground for its entire length. Rock, where encountered, shall be excavated to a depth of 6 inches below the bottom of the pipe, and before pipe is laid the space between bottom of pipe and rock surfaces shall be filled with gravel. Sewer and water pipes shall be laid in separate trenches, except where otherwise noted on the drawings.

b. Backfilling: After pipe lines have been tested, inspected and approved by the Contracting Officer, and prior to backfilling, forms shall be removed and the excavation shall be cleaned of all trash and debris. Material for backfilling shall consist of the excavation, or borrow of sand, gravel or other materials approved by the Contracting Officer and shall be free of trash, lumber or other debris. Backfill shall be placed in horizontal layers not exceeding 9 inches in thickness and properly moistened to approximate optimum requirements. Each layer shall be compacted by hand or machine tampers or by other suitable equipment to a density that will prevent excessive settlement or shrinkage. Backfill shall be brought to a suitable elevation above grade to provide for anticipated settlement and shrinkage.

17-06 MATERIALS AND EQUIPMENT: The following materials and equipment shall conform to the applicable general specifications and the requirements specified below:

a. Calking Lead: Calking lead shall conform to the requirements of Federal Specification QQ-L-156, type I.

b. Fittings:

(1) Cast-Iron Threaded Fittings: Cast-iron threaded fittings shall conform to the requirements of Federal Specification WW-P-501b, type II, class A or B.

(2) Drainage Fittings: Drainage fittings shall be cast-iron and shall conform to the requirements of Federal Specification WW-P-491a, type III.

(3) Fittings for Brass Pipe: Fittings for brass pipe shall conform to the requirements of Federal Specification WW-P-460, class A or B.

(4) Fittings for Copper Tubing: Fittings for copper tubing shall conform to American Standard ASA 440.3, shall be of wrought bronze, wrought copper or cast brass. Fittings shall be of the soldered joint type and shall be completely fabricated at the factory. Bronze fittings shall contain not less than 85 percent copper. All fittings for each piping system shall be of the same material and type.

(5) Malleable-Iron Fittings: Malleable-iron fittings shall conform to the requirements of Federal Specification WW-P-521b, type II.

(6) Nipples: Nipples shall conform to the applicable requirements of Federal Specification WW-N-351. Nipples shall be of the same materials as the pipe system in which they are used.

(7) Unions: Unions on non-ferrous pipe or tubing shall be bronze, of the composition specified for bronze fittings in Federal Specification WW-P-460, 125-pound class, with ground seats.

c. Plumbing Fixtures: Plumbing fixtures shall conform to the requirements of Federal Specification WW-P-541a or WW-P-542, as applicable, except that where cross-or ball-style faucet handles are specified, dome-shield-style handles will be acceptable.

d. Plumbing-Fixture-Setting Compound: Plumbing-fixture-setting compound shall conform to the requirements of Federal Specification HH-G-536.

e. Plumbing-Fixture-Setting Gaskets: Plumbing-fixture-setting gaskets shall conform to the requirements of Federal Specification HH-G-116, type best suited for the work.

f. Pipe and Tubing:

(1) Brass Pipe: Brass pipe shall conform to the requirements of Federal Specification WW-P-351, grade A.

(2) Cast-Iron Soil Pipe and Fittings: Cast-iron soil pipe and fittings shall conform to the requirements of Federal Specification WW-P-401, coated, and shall be of U. S. manufacture.

(3) Copper Tubing: Copper tubing shall conform to the requirements of Federal Specification WW-T-799a, type K, hard drawn.

(4) Steel Pipe: Steel pipe shall conform to the requirements of Federal Specification WW-P-406, type I, II or III, class A, zinc-coated.

g. Sheet Copper: Sheet copper shall conform to the requirements of Federal Specification QQ-C-502, soft temper.

h. Sheet Lead: Sheet lead shall conform to the requirements of Federal Specification QQ-L-201.

i. Twisted Jute Packing: Twisted jute packing shall conform to the requirements of Federal Specification HH-P-117, type II.

j. Valves:

(1) Angle, Check and Globe Valves: Angle, check and globe valves shall conform to the requirements of Federal Specification WW-V-51a, class B, type as suitable for the application, modified for use in connection with copper tubing.

(2) Gate Valves: Bronze gate valves shall conform to the requirements of Federal Specification WW-V-54, type I, II or III, class B, modified for use in connection with copper tubing where required.

17-07 SOIL, WASTE, DRAIN AND VENT PIPING: All underground soil, waste and drain piping, and all above ground soil, waste, drain and vent piping larger than 2-1/2 inch, shall be coated, extra-heavy, hub-and-spigot, cast-iron soil pipe and fittings, except where otherwise noted on drawing. All above ground soil, waste, drain and vent piping 2-1/2 inch and smaller shall be of zinc-coated steel pipe. Above ground threaded drain and waste piping shall have drainage fittings. Fittings on dry vents may be galvanized malleable-iron or cast-iron. Drains below finished floor and to points five foot outside the building shall be made up with extra heavy hub and spigot cast iron soil pipe and fittings.

a. Drainage Pipes and Vent Piping: All horizontal soil and waste pipes shall be given a grade of 1/4-inch per foot, except sizes 4" and over may have a minimum pitch of 1/8-inch per foot. All main vertical soil and waste stacks shall be extended full size to and above the roof line as vents, except where otherwise specifically indicated. Where practicable, two or more vent pipes shall be connected together and extended as one pipe through the roof. Vent pipes in roof spaces shall be run as close as possible to the under side of the roof, ceiling or beams with horizontal piping pitched down to drain stacks without forming traps in pipes, using fittings as required. Vertical vent pipes may be connected into one main vent riser above vented fixture. Where circuit vent or wet vent from any fixture or line of fixtures is connected to a vent line serving other fixtures, the connection shall be at least 4 feet above the floor on which the fixtures are located, to prevent use of any vent line as a waste. Horizontal waste lines receiving the discharge from two or more fixtures shall be provided

with end vents unless separate venting of fixtures is noted. The cast-iron hub-and-spigot pipe inside of buildings shall be extended 3 inches above floor where the lowest floor is self-supporting. No piping except as otherwise shown or approved shall be cast in concrete.

(1) Fittings: Changes in pipe size on soil, waste and drain lines shall be made with reducing fittings or recessed reducers. Changes in direction shall be made by the appropriate use of 45 degree wyes, half wyes, long-sweep 1/4 bend, 1/6, 1/8 or 1/16 bends, except that sanitary tees may be used on vertical stacks and 1/4 bends or elbows may be used in soil and waste lines where the change in direction of flow is from the horizontal to the vertical, and on the discharge from water closets. Where it becomes necessary because of space conditions to use short-radius fittings in any other location, the written approval of the Contracting Officer shall be obtained before they are installed.

(2) Union Connections: Slip joints will be permitted only in trap seals or on the inlet side of the traps. Tucker or hub drainage fittings shall be used for making union connections wherever practicable in connection with dry vents. The use of long screws and bushings, except fittings bushed in the sand, is prohibited.

(3) Joints:

(a) Cast-Iron Pipe: Joints in hub-and-spigot, cast-iron soil, waste and vent pipes and threaded pipe or calking ferrules, shall be firmly packed with oakum or hemp and calked with lead at least one inch deep. Threaded pipe shall have a ring or half-coupling screwed on to form a spigot end.

(b) Threaded Pipe: Threaded joints shall have American National taper screws threads conforming to the requirements of Federal Specification GGG-P-31a with graphite and oil compound applied to the male thread.

17-08 CLEANOUT PLUGS AND TEST TEES: Cleanouts shall be the same size as the pipe, except that cleanout plugs larger than 4 inches will not be required. Cleanouts installed in connection with cast-iron hub-and-spigot pipe shall consist of a long-sweep 1/4 bend or one two 1/8 bends extended to an easily accessible place, or where indicated on the drawings. An extra-heavy, cast-brass ferrule with countersunk trap screw cover shall be calked into the hub of the fitting and shall be, except as otherwise noted on the drawings, flush with the floor. Where cleanouts in connection with threaded pipe are indicated and are accessible, they shall be cast-iron drainage T-pattern 90-degree branch fittings with extra-heavy brass screw plugs of the same sizes as the pipe up to and including 4". Test tees with cast-iron cleanout plugs shall be installed at the foot of all soil, waste and drain stacks and on each building drain outside the building. Where cleanouts occur on pipe concealed in partitions and walls they shall be provided with chromium-plated cast-brass covers secured to brass plugs as shown on figure 105, Federal Specification WW-P-541a.

17-09 FLASHINGS: Vent pipes and roof drains shall be flashed and made watertight at the roof with 16-ounce, soft sheet copper or 6 pound sheet lead. Flashings shall extend not less than 8 inches from the vent pipes and roof drains in all directions. Flashings for steel vent pipe shall be extended up the vent pipes a minimum of 6 inches at which point threaded standard cast-iron or malleable iron recess roof coupling shall be installed to form counter-flashing or rain guards. Flashings in connection with cast-iron pipe vents shall be turned down 1 inch into the pipes or hubs. Flashings for roof drains shall be securely clamped or soldered to the body of the drain to make a watertight, airtight and durable connection. All other piping which passes through waterproof membranes or covering shall be flashed in a similar manner.

17-10 TRAPS: Each fixture and piece of equipment requiring connections to the drainage system, except fixtures with continuous waste, shall be equipped with a trap. Traps are specified to be supplied with the fixtures. Each trap shall be placed as near to the fixture as possible and no fixture shall be double-trapped. Traps installed on hub-and-spigot pipe shall be extra-heavy cast-iron. Traps installed on threaded pipe shall be recess drainage pattern.

17-11 PIPE SLEEVES, PIPE HANGERS, PIPE SUPPORTS AND FIXTURE SUPPORTS: Pipe sleeves, pipe hangers, pipe supports and fixture supports shall be furnished and set, and the Contractor shall be responsible for their proper and permanent location. Pipe will not be permitted to pass through footings, columns, or beams, unless noted on the drawings or approved by the Contracting Officer.

a. Pipe Sleeves: Pipe sleeves shall be installed and properly secured in place at all points where pipes pass through masonry or concrete. Pipe sleeves, except sleeves in footings, shall be two-sizes larger than the pipe and in the case of insulated pipes, shall be of sufficient diameter to provide approximately 1/4-inch clearance around the insulation. Pipe sleeves in footings shall be of cast-iron or steel-pipe and shall be not less than 4 inches larger in diameter than the pipe to be installed. Pipe sleeves in walls and partitions shall be of cast-iron, wrought-iron or steel pipe. Pipe sleeves in floors shall be of galvanized sheet steel weighing 0.90625 pound per square foot (No. 26 galvanized sheet). Sleeves in floors shall extend not less than one inch and not more than 2 inches above the finished floor, and after installation of the pipe, the space around the pipe shall be packed with plastic material and made watertight. Flashing sleeves shall be installed where pipes pass through waterproofing membranes. The sleeves shall be provided with an integral flashing flange or a clamping device to which a flashing shield can be clamped or soldered. Flashing shields shall be of 16-ounce soft sheet copper, shall extend not less than 8 inches from the sleeve, and flashing flanges and shields shall be thoroughly mopped into the membrane. The space between the pipe and sleeve shall be made watertight by inserting a picked oakum gasket and filling the remaining space with poured lead and calking thoroughly.

b. Pipe Hangers and Supports: Horizontal runs of copper tubing shall be supported by steel hangers spaced not more than 8 feet on centers. The hangers shall be of the types detailed on the drawings. Hangers shall be hung from the concrete structure with rods and concrete inserts. Uninsulated copper tubing shall have a section of felt inserted between the clamp or hanger and the tubing. Horizontal runs of soil drainage and vent pipe shall be supported by adjustable expansion pipe hangers having bolted hinged loops and turnbuckles, or an approved equal. Chain or perforated extension bar hangers will not be permitted. Hangers on pipe shall be spaced not more than 10 feet on centers. The hangers shall be anchored with a lag screw having a diameter equal to that of the supporting rod, or to the proper concrete inserts. Vertical runs of the pipe shall be supported by heavy wrought-iron clamps or collars spaced not over 10 feet apart for steel pipe and with copper or brass clamps for copper pipe. Hangers and clamps shall be of a size proportionate to the weight of the pipe supported.

c. Fixture and Equipment Supports and Fastenings: Fixtures and equipment shall be supported and fastened in a satisfactory manner. Where secured to wood partitions, fixtures and equipment shall be fastened with brass wood screws. Where secured to gypsum, fixtures and equipment shall be fastened by means of iron or steel plates 1/8 inch thick, 6 inches wide, and not less than 24 inches long, drilled to receive at least two bolts. Where wood screws are used, screws shall go into solid wood, such as wood inserts, floor joints, studs, or solid pieces set between studs. Through-bolts shall be provided with plates or washers at back, set so that heads, nuts and washers will be concealed by plaster. Exposed heads of bolts and nuts shall be hexagonal with rounded tops finished and chromium-plated, with chromium-plated hexagonal nuts to conceal end of bolts where exposed. Exposed nuts and heads of screws shall be provided with chromium-plated brass washers.

17-12 FLOOR, WALL AND CEILING PLATES: Where uncovered exposed pipes pass through floors, finished walls, or finished ceilings, or other finished surfaces, they shall be fitted with chromium-plated cast-brass plates on chromium plated pipe, or with cast-iron or steel plates on ferrous pipes, except as otherwise specifically noted. Plates shall be large enough to completely close the holes around the pipes and shall be octagonal or round, with the least dimension not less than 1-1/2 inches larger than the diameter of the pipe. Plates shall be secured in approved manner.

17-13 WATER PIPE, FITTINGS AND CONNECTIONS:

a. Copper Tubing: All domestic hot water and cold water piping shall be made up with hard drawn Type K copper tubing of sizes corresponding to those shown on the drawings. Piping shall be made up with wrought copper or bronze or cast bronze solder fittings, except as otherwise shown.

b. Brass Pipe: Brass pipe with screwed bronze fittings shall be used where specifically indicated on the drawing.

c. Installation:

(1) Mains, Branches and Runouts: Pipe and tubing shall be cut with mechanical pipe cutters accurately to measurements established at the building by the Contractor and shall be worked into place without springing or forcing. Care shall be taken not to weaken the structural portions of the building. Piping above ground shall be run parallel with the lines of the building, unless otherwise shown or noted on the drawings. Branches from service lines may be taken off top of main, bottom of main, or side of main, using such cross over fittings as may be required by structural or installation conditions. Service pipe, valves and fittings shall be kept a sufficient distance from other work to permit finished covering not less than 1/2 inch from such other work and not less than 1/2 inch between finished covering on the different services. No water piping shall be buried in floor slab or walls unless specifically indicated on the drawings. Changes in sizes shall be made with reducing fittings. The use of long screws and bushings will not be permitted.

(2) Expansion and Contraction of Tubing: Allowance shall be made throughout for expansion and contraction of tubing. Horizontal runs of tubing over 50 feet in length shall be anchored to the wall or to the supporting construction about midway on the run to force expansion, evenly divided, toward the ends.

(3) Air Chambers: Air chambers shall be provided on both hot and cold supplies, near each faucet or control valve, as applicable, and where not definitely shown on the drawings shall consist of a 12-inch length of tubing fitted with a cap of the same diameter as the branch supply.

d. Joints:

(1) Threaded Pipe: After cutting and before threading, pipe shall be reamed and shall have burrs removed. Screw joints shall be made with graphite and oil or with an approved graphite compound applied to male threads only. Threads shall be full-cut, and not more than three threads on the pipe shall remain exposed. Galking of threaded joints to stop or prevent leaks will not be permitted. Unions shall be provided where required for disconnection. Threads shall be National Taper Pipe Threads.

(2) Tubing: Tubing shall be cut square with mechanical cutters and burrs shall be removed. Both inside of fittings and outside of tubing shall be well cleaned with steel wool before sweating. Care shall be taken to prevent annealing of fittings and hard-drawn tubing when making connections. Installation shall be made by competent, thoroughly experienced workmen and in accordance with the manufacturer's

recommendations. Mitering joints for elbows and notching straight runs of pipe for tees will not be permitted. Joints for soldered fittings shall be made with a non-corrosive paste flux and solid string of wire solder composed of 50 percent tin and 50 percent lead. Cored solder will not be permitted.

e. Insulation: After the piping has been cleaned and satisfactory tests have been completed, nonconducting wool-felt covering specifically designed for copper tubing shall be installed on all hot-water piping, including risers in furred spaces and chasers, and on all horizontal cold-water piping installed inside the building. Covering of branches from supply line to fixture supplies will not be required. Plated brass pipe shall not be covered. The wool-felt covering shall be not less than 3/4 inch in thickness, shall be a sectional pre-formed removable type lined with asphalt-saturated paper and shall be constructed of either solid wool felt or preshrunk indented wool felt. Fittings and valves shall be covered with plastic material containing not less than 85 percent magnesia or asbestos finished with a hard smooth surface flush with the pipe covering. Where spaces do not permit the installation of sectional covering on all pipes in wall chases, the covering may be omitted, provided the chases are packed full of mineral wool, 85 percent magnesia or asbestos. No unions of any kind shall be covered, and covering shall be neatly terminated in levels on each end of such unions with plastic material. Sizing and finish painting shall conform to the requirements of Section on PAINTING, GENERAL, of these specifications.

17-14 UNIONS: Unions on ferrous pipe 2 inches in diameter and smaller shall be malleable-iron, and shall conform to the requirements of Federal Specification WW-U-531, type B, zinc-coated. Unions on non-ferrous pipe shall be as hereinbefore specified. Unions shall not be concealed in walls, ceilings or partitions. Right and left couplings shall be used in lieu of unions in pipe used for structural purposes. Unions shall be installed adjacent to each valve and where required for installation of piping.

17-15 ELECTRICAL WORK: All motors, controls and switching and protective devices required for the proper operation of the equipment shall be furnished under this section of the specifications and shall conform to the requirements of section on ELECTRICAL WORK; INTERIOR, of these specifications. Electrical characteristics shall be as provided on the drawings. Electrical equipment shall be installed and connected in accordance with the requirements of section on ELECTRICAL WORK; INTERIOR, of these specifications.

17-16 PAINTING: All exterior surfaces of piping to be installed in or through concrete floor fill or tile floors and underground shall be given one coat of acid-resisting paint having a bituminous base. Pipe hangers, supports and all other iron work in concealed space shall be thoroughly cleaned and painted with one coat of asphalt varnish. Finish painting of exposed pipe, pipe covering, hangers, supports and

all other ironwork shall conform to the requirements of section on PAINTING; GENERAL of these specifications.

17-17 TYPES OF FIXTURES, FIXTURE TRIMMINGS AND TOILET ACCESSORIES:
The items specified herein are the types of fixtures to be furnished and installed, complete with all trimmings and fittings unless otherwise specified under the item.

a. General Requirements: All equipment, fixtures, valves and trim shall be of approved American manufacture. References made herein to outfit numbers, pattern numbers and figure numbers of vitreous-china and enameled-cast-iron-plumbing fixtures are to Federal Specification WW-P-541a, and of enameled formed-metal plumbing fixtures to Federal Specification WW-P-542. Fixtures and trimmings not covered by the Federal Specifications shall be considered special but shall be of equal quality and material. Generally all fixtures, except water closets, shall have the water supply above the rim. Fixtures with the supply discharge below the rim shall be equipped with backflow preventers. Angle stops, straight stops, stops integral with the faucets, or concealed type of lock-shield loose-key pattern stops for concealed supplies shall be furnished and installed with all fixtures. Exposed traps and supply pipes for all fixtures and equipment shall be connected to the rough piping systems at the wall, unless otherwise specified under the item. Floor and wall plates and escutcheons shall be as specified hereinbefore or as covered by the outfit numbers. Mounting heights shall be as shown on the drawings.

b. Cross Connections: Fixtures and trimmings shall be designed to prevent the backflow of polluted water or waste into the water-supply system.

c. Fixture Connections: Where space conditions will not permit the use of standard fittings in conjunction with the cast-iron floor flange, short-radius fittings, with approval of the Contracting Officer may be used. Connections between earthenware fixtures and flanges on soil pipe shall be made absolutely gastight and watertight with plumbing-fixture-setting compound or plumbing-fixture-setting gaskets. Rubber gaskets or putty will not be permitted for this connection. Closet bolts shall be not less than 1/4 inch in diameter and shall be equipped with chromium-plated nuts and washers. Fixtures with outlet flanges shall be set at the proper distance from floor or wall to make a first-class joint with the closet setting compound or gasket and the fixture used. Fixtures shall be set plumb. Center lines of fixtures shall be at 90° and parallel to the lines of the building. No fixture shall be set in place until the Contracting Officer has examined and approved the outlet flange.

d. Finish of Fittings and Trimmings: The exposed piping, fittings and trimmings shall be chromium-plated on nickel-plated brass with polished bright surfaces conforming to the requirements of Federal Specification WW-P-541a.

- (1) Water Closet: Syphon jet, elongated bowl; Outfit No. E48C.
- (2) Lavatory (Lay) Vitreous-China, 18 x 20": The lavatory shall be vitreous china, outfit No. VB20.
- (3) Corner Lavatory: Corner lavatory shall be outfit No. 116.
- (4) Laundry Tray: Concrete, molded, outfit No. T48 double compartment, with Fig. 89 double laundry tray faucet.
- (5) Combination Bath Tub and Shower:
 - a. For Type C-2 Family Dwelling: Bath tub shall be Outfit No. A66L complete with all fittings and trim except as otherwise specified hereinafter or indicated on the drawings. Drain and overflow shall be figure 99. Shower outfit shall be Outfit No. IC with figure 66A curtain rail except that shower head shall be of the adjustable spray type. Fittings shall be suitable for the piping as detailed on the drawings and all exposed metal parts shall have chromium finish. Actual dimensions of the tubs shall be subject to the approval of the Contracting Officer to conform with the wall finishes.
 - b. For Duplex Family Dwelling: Bathtub and shower combinations shall be as specified in the preceding sub-paragraph, a, except that bath tubs shall be Outfit Nos. A60L as suitable for the positions and piping as indicated on the drawings.
- (6) Kitchen Sink: Kitchen sink shall be flat rim, two compartment. Size 16" x 34" fabricated from #18 U.S.S. ga. (0.05") 18-S solid stainless steel sound deadened with rubberized coating on underside. Sink shall be as detailed on the drawings and furnished complete with double compartment combination supply fitting with swing spout and rinse nozzle, combination drain with basket type strainer. Sink and trim shall be ELKAY LUSTERTONE D126 - A(S) DFS or an approved equal.
- (7) Hose Bibbs: Hose bibbs shall be figure 88, pattern FL, all chromium-plated, with 3/4" National Standard Hose Threaded Spout.
- (8) Lawn Faucet: Angle Pattern, Brass - Fig. 104.

17-18 ELECTRICAL STORAGE WATER HEATERS: Electric storage water heaters shall be of U.S. manufacture and shall conform to the requirements of Federal Specification W-H-196, except that dual element units will be used. Heaters shall be suitable for the available space shown on the drawings and shall operate on single phase, 60 cycle, 230 volt

alternating current. Heaters shall be installed in accordance with the requirements of the section on ELECTRICAL WORK; INTERIOR, of these specifications. Capacity and wattage of heaters shall be as indicated on the drawings.

17-19 RELIEF VALVES: Relief valves shall conform to the requirements of [REDACTED] and shall be of U.S. manufacture. The hot-water storage tank shall be equipped with a pressure-temperature-relief valve. In no case shall a relief valve be installed with a rated capacity less than the output of the heater. Combination temperature-pressure-relief valves shall be installed in a tapping in the top of the tank. The drains from the relief valves shall be terminated as directed.

25X1C

17-20 PAINTING AND FINISHING: Ferrous metal work except stainless steel surfaces, not specified to receive finish painting shall be thoroughly cleaned and given one coat of asphalt varnish. Ferrous metal to receive finish painting shall and will be painted in section on PAINTING; PROTECTIVE, ON METALS, and will be painted as specified in the section on PAINTING; GENERAL, of these specifications.

17-21 INSPECTION AND TESTS:

a. Methods of Sampling - Inspection and Tests: Methods of sampling, inspection and tests for plumbing fixtures and equipment shall conform to the requirements of section F of Federal Specification WW-P-541 or WW-P-542, as applicable.

b. Tests for Plumbing Systems: Soil, waste, vent and water piping shall be tested by the Contractor and approved by the Contracting Officer before acceptance. Piping located underground shall be tested before backfilling. Piping located in inaccessible locations such as toilet pipe spaces, furred walls, ceilings, trenches, etc., shall be tested prior to sealing in. Equipment required for tests shall be furnished by the Contractor without additional cost to the Government.

(1) Drainage System: The entire drainage and venting system shall have all necessary openings plugged to permit the entire system to be filled with water to the level of the highest vent stack above the roof. The systems shall hold this water for 30 minutes without showing a drop greater than 3 inches. Where a portion of the system is to be tested, the test shall be conducted in the same manner as described for the entire system, except that a vertical stack 10 feet above the highest horizontal line to be tested may be installed and filled with water to maintain sufficient pressure, or a pump may be used to supply the required pressure. The pressure shall be maintained for 30 minutes. If and when the Contracting Officer decides an additional test is needed, such as an air or smoke test on the drainage system, the Contractor shall perform such test as part of this contract.

(2) Water System: Upon completion of the roughing-in and before setting fixtures, the entire hot-and cold-water piping systems shall be tested at a hydrostatic pressure of not less than 100 pounds per square inch gage, and proved tight at this pressure. Where a portion of the water piping system is to be concealed, before completion, this portion shall be tested separately in the same manner as specified for the entire system. Any control or piece of equipment which has a working pressure rating lower than the test pressure shall be blocked off or by-passed and separately tested.

(3) Defective Work: If inspection or test show defects, such defective work or material shall be replaced and inspection and tests repeated. Repairs to piping shall be made with new material. Calking of screwed joints or holes will not be acceptable.

(4) Cleaning and Adjusting: At the completion of the work all parts of the installation shall be thoroughly cleaned. All equipment, pipe valves and fittings shall be cleaned of grease and metal cuttings, and sludge which may have accumulated by operation of system for testing. Any stoppage or discoloration or other damage to parts of the building, its finish or furnishings, due to the Contractor's failure to properly clean the piping system, shall be repaired by the Contractor without cost to the Government.

c. Final Test: Upon completion of installation of fixtures for the water system and at a time designated by the Contracting Officer, all water piping shall again be pressure-tested for leaks as hereinafter specified. All water piping and fittings shall be tested hydrostatically and proved tight under a gage pressure of not less than 75 p.s.i. test pressure. After the above tests have been completed, and before the system is accepted, capacity and general operating tests of the systems shall be conducted by a competent and experienced engineer. The tests shall be conducted in the presence of the Contracting Officer or his authorized representative and shall cover a period of not less than 12 hours for the system, and shall demonstrate that the entire system is functioning in accordance with the specifications and to the entire satisfaction of the Contracting Officer. The Contractor shall furnish all instruments, test equipment, and personnel that are required for the tests, and the Government shall furnish the necessary fuel, water and electricity.

17-22 STERILIZATION: The entire water distribution system shall be thoroughly sterilized with a solution containing not less than 50 parts per million of available chlorine. The chlorinating material shall be either liquid chlorine conforming to [REDACTED] or sodium hypochlorite solution conforming to Federal Specification O-B-441, grade D, and shall be introduced into the system in a manner approved by the Contracting Officer. The sterilizing solution shall be allowed to remain in the system for a period of not less than 8 hours, during which time, all valves and faucets shall be opened and closed several times. After sterilization, the solution shall be flushed from the system with clean water until the residual chlorine content is not greater than 0.02 per million. Necessary safety requirements shall be observed. 25X1C

SECTION 18

ELECTRICAL WORK; INTERIOR

18-01 SCOPE: The work covered by this section of the specifications consists in furnishing all labor, equipment, supplies, and materials, not furnished by the Government, and in performing all operations, including cutting, channeling, and chasing, necessary for the installation of complete interior wiring systems, and electrical equipment, in strict accordance with this section of the specifications and the applicable drawings, and subject to the terms and conditions of the contract.

18-02 APPLICABLE SPECIFICATIONS AND STANDARDS: The following specifications and standards, of the issues listed below but referred to by basic designation only, form a part of this specification:

a. Federal Specifications:

J-C-103	Cable and Wire; Rubber-Insulated, Building-Type (0 to 5,000-volt service)
J-C-129	Cable and Wires; Thermoplastic Insulated, Building Type
W-B-616	Boxes and Outlet-Fittings, Floors; (for) Rigid-Steel-Conduit and Electric-Metallic-Tubing (Steel)
W-F-406	Fittings; Cable and Conduit
W-O-806	Outlet-Bodies; Iron (Cast or Malleable), Cadmium-or Zinc-Coated, with Covers and Accessories (for Shore Use)
W-O-821a	Outlet-Boxes; Steel, Cadmium-or Zinc-Coated, With Covers and Accessories
W-P-131a	Panelboards; Equipped with Automatic Circuit-Breakers
W-R-151a	Receptacles (Convenience-Outlets), Adapters, Attachment-Plug-Caps, Cord-Connector-Bodies, Current-Taps, Motor Base-Plugs, and Plug-Bodies; 250-Volts
W-S-893	Switches; Snap, Multiple-Type and Combination Devices, Flush-Type with Wall Plates
W-S-896	Switches; Snap, Single-Unit, Interchangeable Flush-Type with Wall Plates

HH-T-101a Tape; Friction
HH-T-111c Tape; Rubber (Natural and Synthetic),
Insulating
WW-T-806b Tubing; Electric, Metallic

b. Underwriters' Laboratories, Inc.

Standard for Cabinets and Boxes
Standard for Service Equipment
Standard for Industrial Control Equipment

c. National Board of Fire Underwriters:

National Electrical Code, Standard for Electric Wiring
and Apparatus

d. National Electrical Manufacturers Association:

Industrial Control Standards

18-03 GENERAL: Installation shall conform with the applicable rules of the National Electrical Code except where otherwise noted on the drawings and any deviation from the National Electrical Code will be approved in writing by the Contracting Officer. All electrical materials shall be new and as approved by the Underwriter's Laboratories, Inc., except as otherwise specified herein. Defective equipment or equipment damaged in the course of installation or test shall be replaced or repaired in a manner meeting with the approval of the Contracting Officer. The contract drawings indicate the extent and general arrangement of the conduit and wiring systems. If any departures from the contract drawings are deemed necessary by the Contractor, details of such departures and the reasons therefor shall be submitted as soon as practicable, and within 30 days after award of the contract, to the Contracting Officer for approval. No such departures shall be made without the prior written approval of the Contracting Officer.

a. Standard Products: The materials to be furnished under this specification shall be the standard products of approved American manufacturers regularly engaged in the production of such equipment and shall be the manufacturer's latest standard design.

b. Materials and Equipment Schedules: Within 30 days after the date of award of contract and before any material or equipment is purchased, the Contractor shall submit to the Contracting Officer for approval a complete list, in triplicate, of Contractor-furnished materials, fixtures, and equipment to be incorporated in the work. The list shall include catalog numbers, cuts, diagrams, drawings, and such other descriptive data as may be required by the Contracting Officer. No consideration will be given to partial lists submitted from time to time. Approval of materials will be based on manufacturers' published ratings. Any materials, fixtures, and equipment listed which are not in accordance with the specification requirements may be rejected.

c. Options of the Government: If the Contractor fails to submit for approval within the specified time, or any authorized extension thereof, a list of materials, fixtures, and equipment in accordance with the preceding paragraph, the Contracting Officer will select a complete line of materials, fixtures, and equipment. The selection thus made by the Contracting Officer shall be final and binding, and the items shall be furnished and installed by the Contractor without change in contract price or time of completion.

18-04 GROUNDING: Conduit systems, and the neutral conductor of the wiring system shall be grounded. A bare copper conductor, size as indicated on the drawing shall be extended in conduit or tubing from the main service equipment to the point of entrance of the water service. Connection to the water pipe shall be made with a suitable ground clamp or a lug connection to a plugged tee. If flanged pipes are encountered, connection shall be made with a lug bolted to the street side of the flange connection. The grounding system shall be installed in a workmanlike manner and shall be inconspicuous.

18-05 WIRING: Branch-circuit conductors shall be of the sizes indicated on the drawings but not smaller than No. 12 A.W.G. Conductors for signal and pilot control circuits may be No. 14 A.W.G. Conductors shall be continuous from outlet to outlet, and no splices shall be made except within outlet or junction boxes. Junction boxes may be utilized where required. Wire connectors of insulating material or solderless pressure connectors, properly taped, shall be utilized for all splices in wiring where possible. Soldered joints insulated with tape shall be kept to a minimum. Rubber and friction tape shall conform to the requirements of Federal Specifications HH-T-111c and HH-T-101a respectively. Vinyl plastic tape will be acceptable in lieu of rubber and friction tape.

a. Tubing Systems: Electric-metallic tubing systems shall be installed in accordance with the applicable provisions of the National Electrical Code. Electric metallic tubing shall conform to Federal Specification WW-T-306. Electric metallic tubing shall utilize watertight compression-type threadless fittings throughout. Conduit and tubing shall be of 1/2-inch minimum size.

(1) Installation: Tubing shall be concealed within the walls, ceilings, and floors, where possible, and shall be kept at least 6-inches from parallel runs of flues, steam pipes, or hotwater pipes. Exposed runs of tubing shall have supports spaced not more than 8 feet apart and shall be installed with runs parallel or perpendicular to walls, structural members, or intersections of vertical planes and ceilings, with right angle turns consisting of cast-metal fittings or symmetrical bends. Bends and offsets shall be avoided where possible, but where necessary shall be made with an approved hickey or conduit-bending machine. The use of a pipe tee or vise for bending conduits will not be permitted. Tubing which has been crushed or deformed in any way shall not be installed. Expansion fittings or other approved devices shall be used to provide for expansion and contraction where tubing

crosses expansion joints. Wooden plugs inserted in masonry or concrete shall not be used as a base to secure conduit supports. Tubing shall be supported on approved types of galvanized wall brackets, ceiling trapeze, strap hangers, or pipe straps, secured by means of toggle bolts on hollow masonry units, expansion bolts in concrete, machine screws on metal surfaces, and wood screws on wood construction. Where indicated, tubing shall be supported as shown on the drawings. Nails shall not be used as the means of fastening boxes or conduits. Tubing shall be installed in such manner as to insure against trouble from the collection of trapped condensation, and all runs of tubing shall be arranged so as to be devoid of traps wherever possible. The Contractor shall exercise the necessary precautions to prevent the lodgment of dirt, plaster, or trash in conduit, fittings, and boxes during the course of installation. A run of tubing which has become clogged shall be entirely freed of these accumulations or shall be replaced. Wiring shall not be installed in telephone or inter-communication system conduits unless otherwise specified.

(2) Conductors: A complete system of conductors shall be installed in the raceway systems. Conductors installed in ordinarily dry locations shall be rubber-insulated, type R or RU, or thermoplastic-insulated, type T. Conductors installed in wet locations such as in underground raceways, in raceways installed in concrete floor slabs in direct contact with earth, or in raceways regularly subject to moisture or condensation shall be rubber-insulated and lead-covered, type RL, or thermoplastic-insulated specifically designed for such applications, type TW, except as otherwise indicated on the drawings. Rubber-insulated conductors, types R, RL, and RU, shall conform to the requirements of Federal Specification J-C-103. Thermoplastic-insulated conductors, types T and TW, shall conform to the requirements of Federal Specification J-C-129. Home runs may be combined in one conduit, provided all connections are in accordance with National Electrical Code requirements and the maximum unbalanced current in the neutral does not exceed the capacity of the conductor.

18-06 OUTLETS: Outlets shall be installed in the locations shown on the drawings. The Contractor shall study the general building plans in relation to the spaces surrounding each outlet in order that his work may fit the other work required by these specifications. When necessary, the Contractor shall relocate outlets so that, when fixtures or other fittings are installed, they will be symmetrically located according to room layout and will not interfere with other work or equipment. Only zinc-coated or cadmium-plated sheet-steel boxes conforming to the requirements of Federal Specification W-O-821a, of a class to satisfy the conditions for each outlet, shall be used in concealed work. Boxes shall be installed in a rigid satisfactory manner, either by wood screws on wood, expansion shields on masonry, or machine screws on steel work. Fixture outlet boxes on ceilings shall be not less than 4-inch octagonal. Fixture outlet boxes in concrete ceilings shall be of the 4-inch octagonal concrete type, set flush with the finished surface. Fixture outlet boxes on plastered ceilings shall be fitted with open covers set to come flush with the finished surface. Switch, wall telephone, and receptacle outlet boxes shall be not less than

4-inches square, fitted with appropriate plaster covers, where necessary, to set flush with the finished surface. One-piece gang boxes not less than 2-inches deep shall be utilized where necessary. Outlets in exposed work shall be of cast steel or alloy fitted with appropriate covers. Cast-metal fittings shall conform to the requirements of Federal Specification W-O-806.

a. Telephone Outlets: Each wall telephone outlet shall be provided with a 3/8-inch hole in the center. Metal plates shall have a bushed hole. A junction box shall be provided for the telephone as indicated on the drawings and a 1" conduit stub-out shall be provided from the junction box to 5 ft. from the building.

b. Device Plates: A device plate shall be provided for each outlet to suit the device installed. All plates on unfinished walls or on fittings shall be of zinc-coated sheet metal having rounded or beveled edges. All plates on finished walls shall be of brown phenolic compound, having a polished stippled or polished ribbed finish with plain polished borders. Screws shall be of metal with countersunk heads, with finish to match the finish of the plate. Plates shall be installed with all four edges in continuous contact with finished wall surfaces without the use of mats or similar devices. Plaster fillings will not be permitted. Plates shall be installed vertically and with an alignment tolerance of 1/16-inch. Device plates shall be of the one-piece type, of suitable shape for the devices to be covered. The use of sectional device plates will not be permitted.

18-07 WALL RECEPTACLES: Wall receptacles shall conform to the requirements of Federal Specification W-R-151a, type and style as specified. Heavy-duty receptacles shall be of the single type having a capacity to carry the rated load continuously without damage and shall be furnished with a suitable cord-grip cap.

a. Duplex Convenience Receptacles: Duplex convenience receptacles shall be type II, style No. 102, rated 10 amperes at 250-volts and 15 amperes at 125 volts. Switched receptacles, where required, shall be style No. 103. Bases shall be constructed of brown phenolic composition. Terminals shall be mounted on the sides of the base with two screws per terminal. Duplex convenience receptacles installed in damp or wet locations and where specified shall be type II, style No. 130, 3-pole, 2-wire, with the third pole grounded, rated 10 amperes at 250 volts and 15 amperes at 125 volts. Mounting straps shall have plaster ears.

b. Range Receptacles: Flush, molded-plastic, 50-ampere, 250-volts, 3-pole, 3-wire range receptacle shall be type V, style No. 322 or 324. The receptacle shall be furnished with a flexible cord set for connection to the electric range. The cord shall consist of 50-ampere, 250-volt, 3-pole angle type, molded plastic cap with sufficient length of rubber-jacketed cable consisting of two No. 6 and one No. 8 AWG conductors.

c. Radio Receptacle: Combined radio and power receptacle outlet shall be provided where indicated on the drawings. Radio

receptacle shall be provided with cap with special blades that can not be inserted in the power receptacle. A suitable separator shall be provided in the box to separate the antenna and ground wires from the power wires.

18-08 WALL SWITCHES: Wall switches shall be of the totally enclosed tumbler type and shall conform to the requirements of Federal Specification W-S-896 or W-S-893. In addition to the spring actuating the switch, the operating mechanism shall include a positive mechanical means to initiate motion tending to close and/or open the circuit. Enclosures shall be of phenolic composition. Not more than two switches shall be installed in a single gang position of a switch box. All switches shall be suitable for the control of tungsten-filament lamp loads.

18-09 PANELBOARDS: Panelboards shall be of the deadfront, circuit-breaker type and shall be suitable for operation on the electric service indicated on the drawings. Branch circuits shall be balanced on each panel as near as possible so that a minimum of current will flow in the neutral wires. Unless otherwise indicated on the drawings, panelboards shall be provided with the size and number of singles-, double, or triple-pole branches as indicated on the drawings. Circuit-breaker-type panelboards shall conform to the requirements of Federal Specification W-P-131a, Class 1.

18-10 CABINETS: Cabinet boxes shall be constructed of zinc-coated sheet steel and shall conform to the requirements of Underwriters' Laboratories, Inc., Standard for Cabinets and Boxes. Trims and doors shall have a suitable primer coat and a finish coat of a color specifically designated by the Contracting Officer.

a. Panelboard Cabinets: Cabinets for panelboards shall be provided with not less than 4-inch wiring gutters at the sides, top, and bottom. Cabinet heights shall not exceed 72 inches. Cabinets shall be mounted so that the distance from the floor to the center of the top switch or circuit breaker will not exceed 6 feet 6 inches. Flush cabinets shall be provided with trims having adjustable trim clamps. Trims shall be fitted with hinged doors having combination lock and latch. All locks shall be keyed alike. A directory holder with glass plate and metal frame shall be mounted on the inside of each door. A neatly typed directory, properly identifying each circuit, shall be mounted under the glass.

18-11 SECONDARY JUNCTION BOXES: Secondary junction boxes shall be installed where indicated on the drawings for the purpose of tapping secondary service cables. Boxes and covers shall be watertight and shall be made of cast-iron with aluminized finish. A suitable gasket shall be installed between the cover and the box. A sufficient number of cover screws shall be provided to hold the cover firmly in place and tight along its entire contact surface. The size of the boxes shall be as indicated on the drawings, and the required number and size of stub out conduits shall be provided to 5 feet from the building unless otherwise indicated.

18-12 KITCHEN EXHAUST FAN: Where indicated on the drawings, kitchen exhaust fans, of the rating, type and make noted therein, or approved.

equal, shall be provided and installed in accordance with the applicable details shown. The equipment shall be installed in accordance with the manufacturer's drawings and instructions, as approved by the Contracting Officer. Where indicated on the drawings ducts, grilles and dampers shall be provided in accordance with the applicable requirements of the section HEATING SYSTEM, of these specifications, unless otherwise indicated therein.

18-13 MOTORS: Motors shall be of sufficient size for the duty to be performed and shall not exceed their full rated load when the driven equipment is operating at specified capacity under the most severe conditions likely to be encountered. Unless otherwise specified, all motors shall have open frame, class A insulation, and continuous-duty classification based on a 40° C. ambient temperature of reference. Motors shall be suitable for operation on the electric circuit indicated on the drawings.

a. Fractional-Horsepower Motors: Fractional-horse-power motors of single-phase alternating-current and universal types shall conform to the requirements of Federal Specification CC-M-636.

b. Integral-Horsepower Alternating-Current Motors: Integral horsepower alternating-current motors shall conform to the requirements of Federal Specification CC-M-641. Polyphase motors shall be class B, squirrel-cage type, having normal-starting-torque and low-starting-current characteristics unless otherwise specified elsewhere.

c. Other Motors: Motors not included within the scope of paragraphs a and b above shall conform to the design, construction, and performance requirements of Standard D50 of the American Standards Association.

18-14 MOTOR CONTROL: Each motor, or group of motors requiring a single control, shall be provided with a suitable controller and devices which will perform the functions as specified for the respective motors in other sections of these specifications. All controllers shall conform to the adopted standards and recommended practices of the Industrial Control Standards of the National Electrical Manufacturers Association and the Standard for Industrial Control Equipment of the Underwriters' Laboratories, Inc. Each motor, 1/8 horsepower or larger, shall be provided with thermal overload protection. The overload protective device shall be provided either integral with the motor or controller, or mounted in a separate enclosure. Unless otherwise specified, the protective device shall be of the manually reset type. Single or double-pole tumbler switches may be used as manual controllers for motors of $\frac{1}{4}$ horsepower or less in rating. Manual controllers for motors larger than $\frac{1}{4}$ horsepower shall be specifically designed for the purpose and shall have a horsepower rating adequate for the motor. Automatic-control devices such as thermostats or float or pressure switches may control the starting and stopping of motors directly, provided they are designed for that purpose and have an adequate horsepower rating. When the automatic-control device does not have such a rating, a magnetic starter shall be used, with the automatic control device actuating the

pilot control circuits. When manual and automatic control is specified and the automatic-control device operates the motor directly, a double throw three-position tumbler or rotary switch shall be provided for the manual control when the automatic-control device actuates the pilot control circuit of a magnetic starter, the latter shall be provided with a three-position selector switch. Three position switches shall be marked "Manual-Off-Automatic".

18-15. MOTOR-DISCONNECT MEANS: Each motor shall be provided with a disconnecting means when required by the National Electrical Code even though not indicated on the drawing. A circuit breaker or horsepower rated switch in a panelboard will be acceptable as a disconnecting means, if located within sight of the motor controller. A quick-make and quick-break general-use tumbler or snap switch will be acceptable for capacities less than 30 amperes, provided the ampere-rating of the switch is at least double the rating of the controlled equipment. Switches of 50 to 400-ampere capacity shall be of the enclosed, quick-make and quick-break type, horsepower rated. Switches shall disconnect all ungrounded conductors and shall conform to the applicable requirements of Federal Specification W-S-865. Where indicated to be installed outdoors, switches shall be weather resistant.

18-16 LIGHTING-FIXTURES: Lighting-fixtures shall be complete including lamps.

a. Wires: All fixtures shall be wired with an approved type asbestos fixture wire.

b. Location and Height: The exact location and height of fixtures shall be determined by the structural and mechanical limitations of the building, and fixtures shall be installed in such a manner as to avoid obstructions and to give the proper illumination results.

c. Fixture Designations: Fixtures are designated on the drawings by letters. Where only one fixture designation appears in a room or area, the designation shall apply to all fixtures in that room or area.

d. Recessed Fixtures: Each recessed fixture shall be connected to an outlet box located adjacent to the fixture location by means of asbestos covered fixture wire in flexible metal conduit, except where continuous run of recessed fixture are indicated in which case, the channel fixture, if designed for the purpose, may be utilized as a wiring channel and asbestos wire installed therein. Special attention is directed to the maximum permissible depth of the fixture specified. All fixture shall be complete with metal plaster rings and where indicated approved metal hangers. The use of wood will be permitted only to the extent shown on the fixture detail drawings.

18-17 EQUIPMENT CONNECTIONS: Equipment connections shall be made with flexible or rigid conduit as applicable unless otherwise indicated.

Controllers for motors, disconnect switches, and all control, protective, and signal devices for motor circuits, except where such apparatus is furnished mounted and connected integral with the motor-driven equipment, shall be furnished, installed, connected and left in operating condition. The number and size of conductors between motors and control or protective apparatus shall be as recommended by the manufacturer of the apparatus, or as required by the National Electrical Code.

18-18 SIGNAL SYSTEM: A signal system consisting of chime controlled by push button with the necessary transformer as indicated on the drawings. The chime shall be two note, enclosed type for operation with a bell transformer and shall be Edwards 1605 or approved equal.

18-19 CLOSET HEATER: Heaters for closets of the type and capacity indicated shall be provided where shown on the drawings. Guard shall be provided as shown.

18-20 GOVERNMENT-FURNISHED EQUIPMENT:

a. Ranges and Refrigerators: Ranges and refrigerators will be furnished and installed by the Government (Using Agency). However, the Contractor shall provide the cap and cord necessary for the connection of the ranges as specified hereinbefore.

b. Furnaces and Electric Water Heaters: Furnace units and electric water heaters will be furnished by the Government as indicated in the Appendix A of these specifications but shall be completely installed by the Contractor. The Contractor shall furnish all accessories and materials not furnished by the Government but necessary to complete the installation of the furnace units and electric water heaters ready for use. Necessary flexible conduits and wiring shall be provided by the Contractor from junction boxes indicated on the drawings to the terminal boxes of the furnace units and electric water heaters. Mechanical connections and accessories shall be as indicated on the drawings and the applicable sections of these specifications.

18-21 TESTS: After the interior wiring system installation is completed, and at such time as the Contracting Officer may direct, the Contractor shall conduct an operating test for approval. The equipment shall be demonstrated to operate in accordance with the requirements of this specification. The test shall be performed in the presence of the Contracting Officer or his authorized representative. The Contractor shall furnish instruments and personnel required for the tests and the Government will furnish the necessary electric power.

SECTION 19

HEATING SYSTEMS: FORCED-WARM AIR

19-01 SCOPE: The work covered by this section of the specifications consists in furnishing all plant, labor, equipment, appliances and materials not furnished by the Government and in performing all operations in connection with the installation of the forced-warm air heating systems, complete, in strict accordance with this section of the specifications and the applicable drawings, and subject to the terms and conditions of the contract.

19-02 APPLICABLE SPECIFICATIONS: The following specification from a part of this specification:

a. Federal Specifications:

HH-B-671c	Brick; Fire-Clay
HH-C-451b	Clay; Fire, Ground
HH-I-561c	Insulation; Thermal, Asbestos
HH-I-564	Insulation; Mineral-Wool, Block and Board (for Heated Surfaces)
HH-I-578a	Insulation, Vermiculite; Block and Pipe-Covering (Molded)
QQ-A-359b	Aluminum-Alloy (Al-3) (Aluminum-Manganese); Plate and Sheet
QQ-I-716	Iron and Steel; Sheet, Zinc-Coated (Galvanized)
QQ-S-636	Steel; Carbon (Low-Carbon), Sheets and Strips
TT-V-51a	Varnish; Asphalt
WW-V-54	Valves, Bronze, Gate; 125- and 150-Pound Screwed and Flanged (for Land Use)
WW-T-799	Tubing; Copper, Seamless (for use with solder joint)
GGG-P-351a	Pipe-Threads; Taper (American-National)

b. U. S. Department of Commerce Commercial Standard:

CS75-42	Automatic-Mechanical-Draft Oil Burners Designed for Domestic Installations
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c. National Association of Fan Manufacturers Pamphlet:

No. 110 Standards, Definitions, Terms and
Test Codes for Centrifugal, Axial
and Propeller Fans (1950)

d. National Board of Fire Underwriters Pamphlets:

No. 31 Oil Burning Equipments (1950)

No. 90 Air Conditioning, Warm Air Heating,
Air Cooling and Ventilating Systems
(1950; Amendment 1950)

19-03 GENERAL: The contract drawings indicate the extent and general arrangement of the heating systems. If any departures from the contract drawings are deemed necessary by the Contractor, details of such departures and the reasons therefor shall be submitted as soon as practicable to the Contracting Officer for approval. No such departures shall be made without the prior written approval of the Contracting Officer. The warm-air heating installation shall conform to Pamphlet No. 90 of the National Board of Fire Underwriters.

a. Standard Products: All equipment, valves controls and material, to be furnished under this specification shall be the standard products of approved American manufacturers. Where two or more units of the same class of equipment are required, these units shall be products of a single manufacturer; however, the component parts of the systems need not be the products of the same manufacturer.

b. Material and Equipment Schedule: Within 30 days after the date of award of contract and before purchase of any material or equipment, a complete schedule of the Contractor-furnished material and equipment proposed for installation shall be submitted for the approval of the Contracting Officer. The schedule shall include catalogs, performance data, cuts, control diagrams, drawings, and any such other descriptive data as may be required by the Contracting Officer. In the event any items of materials of equipment contained in the schedule fail to comply with the specification requirements, such items may be rejected.

c. Options of the Government: If the Contractor fails to submit for approval within the specified time or any authorized extension thereof, a list of materials, fixtures and equipment in accordance with the preceding paragraph, the Contracting Officer may select a complete line of materials, fixtures and equipment. The selection made by the Contracting Officer shall be final and binding and the items shall be furnished and installed by the Contractor without change in the contract price or time of completion.

19-04 MATERIALS AND EQUIPMENT: The following materials and equipment shall conform to the respective specifications and other requirements specified below:

a. Aluminum Sheets: Federal Specification QQ-A-359b, quarter-hard condition.

- b. Asphalt Varnish: Federal Specification TT-V-51a.
- c. Copper Tubing: Federal Specification WW-T-799, type K.
- d. Electrical Materials and Appliances: ELECTRICAL WORK; INTERIOR, of these specifications.
- e. Firebrick: Federal Specification HH-B-671c, low-heat duty.
- f. Fire Clay: Federal Specification HH-C-451b, class C.
- g. Galvanized Iron or Steel Sheets: Federal Specification QQ-I-716, class D1.
- h. Gate Valves: Federal Specification WW-V-54, class A.
- i. Insulation: Mineral-wool board or blocks conforming to Federal Specification HH-I-564, class A, vermiculite blocks conforming to Federal Specification HH-I-573a; type IV, or asbestos block conforming to Federal Specification HH-I-561c, type I.
- j. Mechanical Equipment: All items of mechanical equipment shall be of the best quality normally used for the purpose in good commercial practice and shall be the products of approved reputable American manufacturers. Each major component of equipment shall have the manufacturer's name, address and catalog number on a name plate securely affixed in a conspicuous place. The name plate of a distributing agent only will not be acceptable. Belts, pulleys, chains, gears, couplings, projecting set screws, keys and other rotating parts located so that any person may come in close proximity thereto shall be fully enclosed or properly guarded.
- k. Unions: Federal Specification WW-U-531, class as required to match adjacent piping.

19-05 WORKMANSHIP: Equipment shall be installed in accordance with the recommendations of the manufacturer and the best standard practice for this type of work.

18-06 FORCED WARM AIR FURNACE UNIT:

a. General: The furnace shall be direct-fired, oil burning, unit type, of the size and capacity not less than that indicated on the drawings when fired with [REDACTED]. All materials necessary for proper assembly shall be furnished with each furnace. When furnace casings, blowers, motors and other parts of equipment are shipped unassembled, all parts shall have been made so as to permit field assembly without grinding, drilling or similar work. Each furnace shall fit the space in which it is to be installed so as to allow ample room for maintenance. The furnace shall have combustion spaces designed to withstand possible explosions resulting from delayed ignition of the oil. The unit shall be approved by the Underwriters' Laboratories, Inc., and shall be the type and make indicated in the drawings or approved equal.

b. Heat Exchanger: Heat exchanger shall have a high efficiency of heat transfer between the products of combustion and the circulated air for heating. The gas passages shall be designed to minimize air friction. The heat exchanger shall be so constructed so that the warm air for heating will not be subject to contamination with the products of combustion. The heat exchanger shall be designed to allow the metal to expand or contract without causing damage to any part, and shall be constructed of steel and cast iron of suitable composition and weight.

c. Combustion chamber shall be constructed of steel, cast-iron, refractory or a combination of these materials. Low carbon steel or cast iron used in the combustion chamber shall be protected with not less than 2 inches of refractory in areas where flame impingement may occur. The use of protecting refractory is not required for stainless steel, combustion chambers, unless surface temperatures of the steel exceeds 90% of the scaling temperature (degree F). The necessary pressure relief openings shall be provided to safeguard the furnace against explosion damage due to delayed ignition.

d. Cabinet encasing of the heat exchanger shall be properly insulated, and protected against corrosion by means of enamel or other suitable heat resisting protective finish. Galvanized-iron liners forming 1-inch air spaces will be considered as complying with the requirements for insulated cabinets. The cabinets shall be constructed of sheet metal not lighter than 0.0179 inch (26 gage) in thickness, and shall be provided with suitable duct connection openings.

e. Supply-Fan Unit: Supply-fan units shall be installed at the return side of the furnace and shall have a capacity not less than shown on the drawings. The fan unit shall be encased in a rigid housing designated to contain both fan and filters. The static pressure indicated on the drawings for the fan shall be considered as representing the pressure loss through the ductwork only, and shall be increased adequately to compensate for the loss through the furnace and filters. Fan shall be rated and constructed in accordance with Bulletin No. 110 of the National Association of Fan Manufacturers, Inc. The fan shall be mounted on approved sound-absorbing foundation pads, and shall be practically noiseless in operation. The Contractor shall submit printed catalog evidence showing that the fan capacity and speed is certified for quiet operation. Impeller wheels shall be the multi-blade type, heavily and rigidly constructed. Each wheel shall be supported by two bearings, and shall be accurately balanced both statically and dynamically. Fans may be either directly or indirectly connected to the driving electric motors. V-belt drives shall be designed for at least 50-percent overload capacity, and shall be provided with convenient means of tightening or replacement. Electric motors shall be an open type, suitable for the available electric service, and provided with thermal-overload protection. Motors shall conform to the requirements of the section on ELECTRICAL WORK: INTERIOR, of these specifications.

f. Air Filters: Throw-away-type air filters 2 inches thick shall be installed. Convenient means of replacing the air filters in the installation conditions shown on the drawings shall be provided.

19-07 OIL BURNING EQUIPMENT: Oil-burning equipment shall include the oil burner, motor, ignition equipment, controls, oil lift pump, oil pipe and fittings, and all other items necessary for the complete installation of a fully automatic oil-burning heating system. All fuel-oil-burning equipment shall be approved by the Underwriters' Laboratories, Inc., and shall be installed in accordance with Pamphlet No. 31 of the National Board of Fire Underwriters.

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a. Oil Burner: Oil burner shall conform to the requirement of United States Department of Commerce Commercial Standard CS75-42 when within the scope thereof. The oil burner shall be of the type regularly furnished with the furnace by the manufacturer, and shall be suitable for handling [REDACTED] without preheating. The burner shall be quiet in operation, and shall operate with a balanced flame so as not to localize heat in any part of the combustion chamber. The burner shall be capable of completely atomizing or vaporizing and effectively mixing the oil or vapor with the air so as to insure complete combustion. The air admitted shall be of sufficient quantity for complete combustion, but not of such quantity as to produce an undue percentage of excess air with the attendant high stack loss.

b. Motor: The oil-burner motor shall be totally enclosed and shall be provided with thermal-overload protection. The motor shall suit the characteristics of the available electric service and shall conform to the requirements of the section on ELECTRICAL WORK; INTERIOR, of these specifications. The motor shall have sufficient capacity to operate the oil pump and fan so as to develop 100 percent of the specified furnace rating.

c. Automatic Draft Regulator: Automatic draft regulator shall be installed in the side of the smoke pipe. The regulator shall consist of a weighted and balanced damper of proper size for the furnace capacity. The damper shall open or close automatically as the chimney draft varies, so as to maintain a constant draft at the furnace outlet.

d. Fuel-Oil Storage Tank shall have a capacity as indicated on the drawings. The tank shall be constructed and installed in accordance with details shown and specifications on the drawings and the applicable requirements of Pamphlet No. 31 of the National Board of Fire Underwriters except as otherwise indicated on the drawings. The tank shall be provided with welded, reinforced threaded openings or flanges for all pipe connections, including oil-fill, vent and oil-burner connections. The tanks shall be installed underground. A removable foot valve and strainer shall be provided, for the suction of the oil-burners, inside the tank. Concrete mass anchorage shall be provided as shown.

(1) Cleaning and Painting of Underground Tank: The storage tank, before being placed in the ground, shall be cleaned and painted as follows: The tank shall be cleaned thoroughly of all loose rust, blisters, loose scale, oil paint of type different from the field primer, and other substances that would interfere with the proper adhesion of the protective coating. Mill scale that cannot be removed by hand-wire brushing need not be removed. Oil and grease shall be removed with mineral spirits or other acceptable solvent having a flash point higher than 80°F.

After cleaning, a primer coat shall be applied to the outside of the tank only. The primer shall consist of processed coal-tar pitch and refined coal-tar oils suitably blended to permit application by brush or spray. The primer shall contain no highly volatile solvents or added pigments and shall dry hard within 6 hours. The primer shall not be heated, but the temperature of the metal and the primer temperature at time of application shall be 60° to 80°F. After the prime coat has become hard to the touch, an enamel coat composed of a specially processed coal-tar pitch combined with an inert mineral filler shall be applied hot, in a layer not less than 1/16-inch-thick, and in accordance with the manufacturer's recommendations. The enamel shall be free of all asphalt. The use of fluxing oils or thinner to reduce cracking susceptibility in cold weather will not be permitted. Primers and enamels herein mentioned shall not sag or flow from a vertical surface when exposed to an atmospheric test temperature of 160°F, and shall not become brittle, crack, check or peel when exposed to an atmospheric temperature of minus 200°F. After the enamel is completely applied and cold, all coated surfaces shall be tested with an electric wire-brush holiday detector. The wire brush shall be placed flat in contact with the enamel surfaces and passed over the surface once only at the rate of approximately 35 to 50 feet per minute. Any evidence of missed places will be indicated by an electric sprak between the brush and the metal surface. All missed places so indicated shall be marked by chalk or crayon and promptly repaired by a single application of hot enamel. No recheck of repaired areas will be required.

e. Oil Pipe and Fittings: Fuel oil piping shall be made up with type K hard drawn copper tubing with wrought bronze or wrought copper solder joint fittings. Final connections at tank and at burner shall be indicated on the drawings.

19-08 CONTROLS: Controls for the furnace shall consist of a room thermostat, a combination high- and low-limit bonnet thermostat, and a stack switch. The room thermostat shall start or stop the oil burner automatically as the room temperature respectively falls below or rises above the predetermined point. The high-limit bonnet thermostat shall be arranged to take control from the room thermostat and shut off the oil burner whenever the bonnet temperature rises above the predetermined high limit. The low-limit bonnet thermostat, set at approximately 90 degrees F., shall be arranged to cause the supply fan to start and run continuously whenever the bonnet temperature is above the predetermined point. Provision shall be made for summer ventilation through manual

operation of the circulating fan by a switch connected in parallel with the bonnet thermostat. A delayed-action stack switch or equivalent device shall be installed to shut off the oil burner automatically in case the oil fails to ignite on starting.

a. Bonnet Thermostats: Bonnet thermostats shall be an electric type and shall be suitable for operation in conjunction with the supply fan and heat-regulating devices. Bonnet thermostats shall be designed with an approximate high-limit range of from 100 degrees F. to 250 degrees F., with an approximate differential of 25 degrees F., and with an approximate low-limit (fan) range of 50 degrees F. to 200 degrees F., with a differential of approximately 25 degrees F. The thermostats may be combined as one instrument. Thermostats shall be provided with means of locking the settings. Each thermostat shall be equipped with a flange or other device to provide a space of not less than 1 inch between the sheet metal of the bonnet and the thermostat housing containing the electrical switches.

b. Room Thermostats: Unless otherwise shown room thermostats shall be the lock-shield type equipped with thermometers. Thermostats shall be designed to operate on not more than a 3 degree F. differential over a temperature range of approximately 55 degrees F. to 85 degrees F. and shall be set to maintain a room temperature of approximately 70 degrees F.

19-09 SMOKE STACK AND CONNECTION: Smoke stacks shall be constructed in accordance with details on the drawings and shall be provided with supports as shown therein. The furnace shall be connected to the stack or flue by means of smoke connection constructed of black iron or steel sheets not less than .0598 inch in thickness (16 gage). The clear distance between uncovered smoke connections and combustible material or construction, including plaster on combustible base, shall be not less than 18 inches. The clearance may be reduced to 9 inches where the smoke connection is protected by not less than 1 inch of asbestos or its equivalent or where combustible material in ceilings, beams or walls is protected by sheet metal or equivalent covering placed at least 1 inch from the surface to be protected and extending the full length of the smoke connections and not less than 12 inches beyond it on both sides. Suitable cleanouts shall be provided which will permit cleaning the entire smoke connection without dismantling.

19-10 FLEXIBLE CONNECTION: Flexible fireproof connections of asbestos or glass fabric, to prevent the transmission of vibration through the ducts to the rooms, shall be installed on the supply side of the heat exchanger, approximately where shown on the drawings, or as directed by the Contracting Officer. Cloth used for flexible connections shall be of proper weight and strength for the service required, and shall be properly filled to be rendered relatively airtight.

19-11 DUCTWORK: Sheet-metal duct work indicated on the drawings, for the heating of the building including kitchen exhaust fan duct, shall be erected in a first-class work-manlike manner, and shall be approved by the Contracting Officer. Ducts, unless otherwise approved,

shall be true to the dimensions indicated on the drawings and straight and smooth on the inside, with neatly finished joints. The ducts shall be securely anchored to the building in the manner shown on the drawings and shall be so installed as to be completely free from vibration under all conditions of operation. The ducts shall be properly braced and reinforced with steel angles or other structural members spaced not more than 60 inches on centers. Slip joints shall be made in the direction of flow, and unless otherwise indicated on the plans, elbows shall have a center-line radius not less than one and one-half times the width of the duct. The sheet metal used shall be galvanized iron or steel, or aluminum. The thickness of the sheet metal size and spacing of the stiffeners used shall conform to table I and II, unless otherwise indicated on the drawings.

TABLE I - Weights and gages for duct metal

Longest dimension of rectangular ducts or diameter of round ducts (inches)	Weight of galvanized steel (pounds per square foot)	Galvanized steel sheet gage number	Thickness of aluminum sheet (inches)
Up to 12 -----	0.90625	26	0.025
Over 12 to 30 -----	1.1562	24	0.032
Over 30 to 48 -----	1.4062	22	0.040

TABLE II - Stiffeners for ducts

Surface width or height of ducts (inches)	Steel angle Stiffeners size (inches)	Center spacing (inches)	Weight of angle (pounds per foot before galvanizing)
Up to 24 -----	Not required ----- (Cross broken panels or 2 weights heavier Ducts)		
Over 24 to 48 -----	1 x 1 x 1/8 -----	48 to 60 -----	0.80

19-12 AIR OUTLETS: Grilles and registers shall be standard product of manufacturer indicated on the drawings or approved equal.

a. Grilles: Grilles shall be constructed of sheet metal of approved composition and weight and shall have dimensions and net free areas as indicated on the drawings.

b. Registers: Registers shall be of the types noted on the drawing, of sturdy construction with adjustable vertical and horizontal vanes for double deflection and multi-shutter damper as indicated on the drawings.

19-13 DAMPERS: Splitter dampers shall be constructed of galvanized iron or steel sheets one gage heavier than the ducts in which they are installed, conforming to Table I. Dampers shall be provided with approved bearings at both ends of the shafts. Dampers shall be close-fitting and shall be provided with adjustment quadrants and locking devices. Supply volume dampers shall be as required to establish system balance and as shown on the drawings. Dampers shall be so designed as to offer a minimum of resistance to the flow of air.

19-14 INSULATION: The furnace if not factory insulated, shall be insulated with 1-inch thickness of asbestos air cell or thermally equivalent thickness of other suitable insulation approved by the Contracting Officer. The insulation shall be securely held in place in a manner approved by the Contracting Officer. If wire is employed for this purpose, suitable provisions shall be made to prevent the wire from cutting through the insulation at the corners of the ducts. The bonnet, plenum and supply duct in the furnace room and above ceiling, shall be insulated as herein specified. All joints in the insulation shall be neatly filled with an insulating cement approved by the Contracting Officer.

19-15 ELECTRICAL WORK: All electrical equipment and installation shall conform to the applicable requirements of the section on ELECTRICAL WORK, INTERIOR, of these specifications.

19-16 PAINTING: Ferrous metal work not specified elsewhere to receive finish painting shall be thoroughly cleaned and give one of asphalt exposed in finished rooms shall be primed as specified on the section on PAINTING, PROTECTIVE ON METAL, and will be finished painted as specified in the section on PAINTING, GENERAL, of these specifications.

19-17 TOOLS: All special tools necessary for the proper operation and maintenance of the heating equipment shall be furnished for maintenance and installed in the heater room in a manner approved by the Contracting Officer. Smoke-pipe and flue pass cleaners shall be provided. Wrenches shall be installed in hardwood containers.

19-18 OPERATION AND MAINTENANCE INSTRUCTIONS: Printed instructions covering the operation and maintenance of each item of equipment shall be posted at locations designated by the Contracting Officer. Upon completion of the work, and at a time designated by the Contracting Officer, the services of a competent engineer shall be provided for a period of not less than 1 day to instruct a representative of the Government in the operation and maintenance of the heating systems.

19-19 TESTS: Upon completion and prior to acceptance of the installation, the Contractor shall subject the heating system to such operating tests to properly demonstrate satisfactory functional and operating efficiency of the warm air furnace, duct system and automatic controls. Operating tests shall cover a period of not less than 6 hours for each system, and all tests shall be conducted at such times as the Contracting Officer may direct. All instruments, facilities and labor required to properly conduct the tests shall be provided by the Contractor at no additional cost to the Government, and all fuel, water and electricity required will be furnished by the Government.

SECTION 20

DISMANTLING, DEMOLITION, SALVAGE, AND
DISPOSITION OF BUILDINGS

20-01 SCOPE: The work covered by this section of the specifications consists in furnishing all plant, labor, equipment, appliances, and materials not furnished by the Government, and in performing all operations in connection with the dismantling, demolition, salvaging, and disposition of existing buildings, complete in strict accordance with this section of the specifications and the applicable drawings, and subject to the terms and conditions of the contract.

20-02 WORK TO BE PERFORMED:

a. General: Ten [REDACTED] indicated on the drawings or by the Contracting Officer shall be dismantled and/or demolished and removed from the site. The Contractor shall become the sole owner of the dismantled or demolished buildings, including all equipment and materials salvaged from them. 25X1C

b. Disconnection of Services: Before starting work on the buildings, the utilities, connections, or services thereto shall be disconnected, and the mains sealed in a manner approved by the Contracting Officer.

(1) All poles, accessories and other materials of the electric supply lines to the buildings shall be removed in a manner to prevent damage, shall remain the property of the Government and shall be transported to storage points indicated by the Contracting Officer.

c. Dismantling and Demolition:

(1) Schedule of Work: Work shall be started and completed in order of precedence as established by a schedule of work approved by the Contracting Officer, and prepared before any work is begun.

(2) Buildings: Buildings shall be dismantled and/or demolished as hereinafter prescribed. Provisions, approved by the Contracting Officer, shall be made to avoid interference with the use of adjoining buildings or the interruption of free passage thereto. Operational procedures and sequences for dismantling and demolition work shall be optional with the Contractor insofar as they do not infringe on the work schedule approved by the Contracting Officer. 25X1C

[REDACTED]
Dwelling is ready for occupancy, unless otherwise directed by the Contracting Officer. The sequence of operations shall be such as to provide safe working conditions. All concrete footing, foundations and slabs, if any, shall be demolished and removed to the extent and in a manner as will not interfere with construction and as approved by the Contracting Officer.

(3) Dynamite and Powder: No dynamite or powder shall be used for blasting nor brought to the site except on prior written permission of the Contracting Officer.

(4) Protection of Persons and Property: Adequate protection of persons and property shall be provided at all times. The work shall proceed in such manner as to prevent the undue spread of dust and flying particles.

(5) Burning of Materials and Debris: No materials or debris shall be burned on the premises except under such provisions and in such manner as specifically approved by the Contracting Officer.

(6) Payments: No payment will be made by the Contractor to the Government for the [REDACTED] which become the property of the Contractor and the values of which will be considered as partial compensation to the Contractor for the work under this contract, in addition to those stipulated on the Unit Price Schedule. No separate payment will be made to the Contractor for the dismantling and removal of the [REDACTED], which work will be considered as subsidiary obligation of the Contractor under this contract.

25X1C

25X1C

20-03 Deleted; not applicable.

20-04 CLEANING UP: Upon completion of dismantling, all salvaged material shall be removed as soon as practicable and in a manner approved by the Contracting Officer. When material designated for scrap is burned, proper precautions and provisions shall be affected for the protection of property from effects of the fire. The burned-over area shall be raked clean and any unburned debris shall be disposed of as fill or as otherwise directed by the Contracting Officer.

SECTION 21

GRADING

21-01 SCOPE: The work covered by this section of the specifications consists in furnishing all labor, equipment, supplies, and materials, not furnished by the Government, and in performing all operations in connection with the excavating, filling, and grading required for overall grading of the areas indicated, complete, in strict accordance with this section of specifications and the applicable drawings, and subject to the terms and conditions of the contract.

21-02 APPLICABLE STANDARD: The following standard of the American Association of State Highway Officials forms a part of this specification:

T 99-49

Standard Laboratory Method of Test for
the Compaction and Density of Soil

21-03 CONSERVATION OF VEGETATION AND TOPSOIL: Vegetation and topsoil in the area shall be dug out and left in the vicinity of the area where directed by the Contracting Officer. Topsoil shall be removed to a depth of 4 inches and shall be piled where directed by the Contracting Officer. Contractor shall remove vegetation and existing shrubs in a manner acceptable to the Contracting Officer so that they can be salvaged and replanted at a later date. No landscaping nor replanting of shrubs will be done by the Contractor.

21-04 EXCAVATION: After all stripping has been done, excavation of every description and of whatever substances encountered within the grading limits of the project shall be performed to the lines and grades indicated on the drawings, or as directed by the Contracting Officer. All suitable excavated material shall be transported to and placed in the fill areas within the limits of the work as specified and as shown on the drawings, or as otherwise directed by the Contracting Officer. Where material encountered within the limits of the work is considered unsuitable by the Contracting Officer, such material shall be excavated below the grade shown on the drawings or as directed by the Contracting Officer, and replaced with suitable material. All such material excavated and the material used for backfilling shall be included in and will be paid for as excavation. All excavated materials which are considered unsuitable by the Contracting Officer and any surplus of excavated material which is not required for fill shall be known as "waste" and shall be disposed of in adjacent areas as directed by the Contracting Officer by the Contractor at its own expense and responsibility, and to the satisfaction of the Contracting Officer. Unless otherwise directed by the Contracting Officer, all waste shall be disposed of outside the limits of the work. During construction, excavation and filling shall be performed in a manner and sequence that will provide drainage at all times. Material required for fills in excess of that produced by normal grading operations shall be excavated from areas selected by the Contractor and approved by the Contracting Officer.

21-05 ROCK FOR SLOPE PROTECTION: Coarse rock from excavation shall be conserved and used for protection against erosion, as indicated on the drawings or directed by the Contracting Officer. Hand placing of coarse rock from excavation will not be required, except when specifically called for in connection with some particular requirements covered by other provisions in the specifications.

21-06 PROTECTION OF EXISTING SERVICE LINES AND UTILITIES STRUCTURES: The existing service lines and utilities structures shown on the drawings, the location of which is known to the Contractor prior to excavation or construction of fills or embankments, shall be protected and safeguarded from damage during grading operations and if damaged, shall be repaired by the Contractor at its expense. The above provisions are applicable to all service lines or utilities structures, all or any portion of which protrudes above the original ground surface or lies beneath ground surface within any grading area. Any existing line or utility structure which is not shown on the drawings or the location of which is not known to the Contractor in sufficient time to avoid damage, if inadvertently damaged, shall be repaired by the Contractor, and an adjustment in payment will be made by the Government at rates determined and approved by the Contracting Officer. If extra expense is incurred by the Contractor in protecting and safeguarding any service line or utility structure which is not shown on the drawings and is not known at the time of bidding, adjustment in payment will be made by the Government at the rates determined and approved by the Contracting Officer.

21-07 BACKFILL ADJACENT TO STRUCTURES: Symmetrical backfill loading shall be maintained. Special care shall be taken to prevent any wedging action or eccentric loading upon or against the structure, and all slopes bounding or within the areas to be backfilled shall be stepped or serrated to prevent such wedging action. During backfilling operations, and in the formation of embankments, care shall be exercised that the equipment used will not overload the structure in passing over and compacting these fills. Backfill for utilities shall conform to the additional requirements of Section on EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS, of these specifications.

21-08 PREPARATION OF GROUND SURFACE FOR FILL: All vegetation, such as roots, brush, heavy sods, heavy growth of grass, and all decayed vegetable matter, rubbish, and other unsuitable material within the area upon which fill is to be placed, shall be stripped or otherwise removed before the fill is started. In no case will such objectionable material be allowed to remain in or under the fill area. Sloped ground surfaces steeper than one vertical to four horizontal on which fill is to be placed, shall be plowed, stepped (benched), or broken up in such manner that the fill material will bond with the existing surface, as directed or approved by the Contracting Officer. Prepared surfaces shall be wetted and compacted as directed by the Contracting Officer. River water may be used for wetting.

21-09 FILL: Fills, or embankments herein designed as fills, shall be constructed at the locations and to the lines and grades indicated on the drawings and as directed by the Contracting Officer. The completed fill shall correspond to the shape of the typical sections shown on the drawings or shall meet the requirements of the particular case. All suitable material removed from the excavation shall be used in forming the necessary fill. All fill material shall be reasonably free from roots or other organic material, trash and from all stones having a maximum dimension greater than 6 inches. Stones larger than 4 inches, maximum dimensions shall not be permitted in the upper 6 inches of fill or embankment. The material shall be placed in successive horizontal layers of from 8 inches to 12 inches in loose depth, as specified or as directed by the Contracting Officer, for the full width of the cross section.

21-10 COMPACTION: Except as otherwise specified, the degree of compaction and density for embankment or fills shall be determined and controlled in accordance with the requirements of [REDACTED] with the following modifications:

a. The mold shall be 6 inches in diameter and 7 inches high. A metal spacer disk 5-15/16 inches in diameter and 2-1/2 inches high shall be used as a false bottom in the mold during compaction.

b. In lieu of removing all material retained on a No. 4 sieve, all material over 3/4 inch in size shall be removed and replaced with an equal portion of material between 0.18 inch (No. 4 sieve) and 3/4 inch in size.

c. The weight of the rammer or metal tamper shall be 10 pounds instead of 5.5 pounds, and the tamper shall be dropped from a height of 18 inches instead of 12 inches.

d. The samples shall be compacted in five layers, each approximately 1 inch thick and each layer receiving 55 blows with the specified tamper.

e. A separate batch of soil shall be used for each compaction test specimen. No material shall be reused.

21-11 FINISHED EXCAVATION, FILLS, AND EMBANKMENTS: Uniformly smooth grading of all areas covered by the project, including excavated and filled sections and adjacent transition areas, shall be accomplished. The finished surface shall be reasonably smooth, compacted, and free from irregular surface changes. The degree of finish shall be that ordinarily obtainable from either blade-grader or scraper operations, except as otherwise specified. The finished surface shall be not more than 0.15 foot above or below the established grade or approved cross section. The surface of embankments or excavated areas for road construction or other areas to be paved, on which a base course or pavement is to be placed, shall not vary more than 0.05 foot from the established grade and approved cross section.

21-12 PROTECTION: Newly graded areas shall be protected from the action of the elements, and any settlement or washing that may occur from that or any other cause, prior to acceptance of the work, shall be repaired, and grades reestablished to the required elevations and slopes.

SECTION 22

EXCAVATION, TRENCHING AND BACKFILLING
FOR UTILITIES SYSTEMS

22-01 SCOPE: The work covered by this section of the specifications consists in furnishing all plant, labor, equipment, appliances and materials, not furnished by the Government, and in performing all operations in connection with the excavation, trenching and backfilling for sanitary sewers, water lines and electrical lines to points of connection with the building utilities 5 feet outside the building to be served, complete, in strict accordance with this section of the specifications and the applicable drawings, and subject to the terms and conditions of the contract.

22-02 WORK NOT INCLUDED: All excavation for utilities systems occurring within the enclosing walls or appurtenances of buildings and out to a line 5 feet outside of the walls or appurtenances thereof, is covered under section on EXCAVATION, FILLING AND BACKFILLING FOR BUILDING CONSTRUCTION, for the particular structure or structures, and is not included under this section of the specifications.

22-03 EXCAVATION:

a. General: The Contractor shall perform all excavation of every description and of whatever substances encountered, to the depths indicated on the drawings or as otherwise specified. During excavation, material suitable for backfilling shall be piled in an orderly manner a sufficient distance from the banks of the trench to avoid overloading and to prevent slides or cave-ins. All excavated materials not required or suitable for backfill shall be removed and wasted as directed by the Contracting Officer. Such grading shall be done as may be necessary to prevent surface water from flowing into trenches or other excavations, and any water accumulating therein shall be removed by pumping or by other approved method. Such sheeting and shoring shall be done as may be necessary for the protection of the work and for the safety of personnel. Excavation shall be by open cut.

b. Trench Excavation: Trenches shall be of necessary width for the proper laying of the pipe, and the banks shall be as nearly vertical as practicable. The bottom of the trenches shall be accurately graded to provide uniform bearing and support for each section of the pipe on undisturbed soil at every point along its entire length, except for the portions of the pipe sections where it is necessary to excavate for bell holes and for the proper sealing of pipe joints. Bell holes and depressions for joints shall be dug after the trench bottom has been graded and, in order that the pipe rest upon the prepared bottom for as nearly its full length as practicable, shall be only of such length, depth, and width as required for properly making the particular type of joint. Except where rock is encountered, care shall be taken not to excavate below the depths indicated. Where rock excavation is required, the rock shall be excavated to a minimum overdepth of 4 inches below the trench depths indicated on the drawings or specified. Overdepths

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with loose, granular, moist earth, thoroughly tamped. Whenever wet or otherwise unstable soil that is incapable of properly supporting the pipe, as determined by the Contracting Officer, is encountered in the bottom of the trench, such soil shall be removed to the depth required and the trench backfilled to the proper grade with coarse sand, fine gravel, or other suitable material, as hereinafter specified. Specified requirements relating to specific utilities are as follows:

(1) Water Lines: Except in cases where water lines must be graded, as indicated on plans, to avoid high points with the necessity of placing air release and vacuum valves, trenches for water lines shall be of a depth that will provide a minimum cover over the top of the pipe of 2½ feet from the existing ground surface or the indicated finished grade, whichever is lower, and avoid interference of the water lines with other utilities.

(2) Sanitary Sewers: For sanitary sewers, the width of the trench at and below the top of the pipe shall be such that the clear space between the barrel of the pipe and the trench wall shall not exceed 8 inches on either side of the pipe. The width of the trench above that level may be as wide as necessary for sheeting and bracing and the proper performance of the work. The bottom of the trench shall be rounded so that at least the bottom quadrant of the pipe shall rest firmly on undisturbed soil for as nearly the full length of the barrel as proper jointing operations will permit. This part of the excavation shall be done normally only a few feet in advance of the pipe laying by men skilled in this type of work.

(3) Electric Lines (Underground): The trench for underground electric lines shall be not wider than necessary for the proper laying of such lines. However, the banks of such trenches need not be kept vertical but may be sloped or widened to such limits as may be set by the Contracting Officer and which will not interfere with other utilities.

22-04 PROTECTION OF EXISTING UTILITIES: The existing utilities that are shown on the drawings or the location of which is made known to the Contractor prior to excavation shall be protected from damage during the excavation and backfilling of trenches, and if damaged, shall be repaired by the Contractor at his expense. Any existing utility that is not shown on the drawings or the location of which is not known to the Contractor in sufficient time to avoid damage, if inadvertently damaged during excavation, shall be repaired by the Contractor; and adjustment in payment will be made by the Government at the rates determined or approved by the Contracting Officer.

22-05 BACKFILLING: The trenches shall not be backfilled until all required pressure tests are performed and until the utilities systems as installed conform to the requirements specified in the several sections covering the installation of the various utilities. Where, in the opinion of the Contracting Officer, damage is likely to result from withdrawing sheeting, the sheeting shall be left in place. The trenches shall be carefully backfilled with the excavated materials approved for backfilling, consisting of

earth, loam, sandy clay, sand and gravel, soft shale, or other approved materials, free from large clods of earth or stones, deposited in 6-inch layers and thoroughly and carefully rammed until the pipe has a cover of not less than 1 foot for water lines or electric lines and 2 feet for sanitary sewers. Where the pipe is specially coated for protection against corrosion, care shall be taken not to damage the coating. The remainder of the backfill material shall then be thrown into the trench in 1-foot layers and tamped. Settling the backfill with water will be permitted, and will be a requirement when so directed by the Contracting Officer. Any trenches improperly backfilled, or where settlement occurs, shall be reopened to the depth required for proper compaction, then refilled and compacted, with the surface restored to the required grade and compaction, mounded over, and smoothed off. Open trenches across roadways or other areas to be paved shall be backfilled as specified above, except that the entire depth of a trench shall be backfilled in 6-inch layers, and each layer shall be moistened and compacted to a density at least equal to that of the surrounding earth and in such manner as to permit the rolling and compaction of the filled trench with the adjoining earth to provide the required bearing value, so that paving of the area can proceed immediately after backfilling is completed. Along all other portions of the trenches, the ground shall be graded to a reasonable uniformity and the mounding over the trenches left in a uniform and neat condition to the satisfaction of the Contracting Officer.

a. Test for Displacement of Sewers: Sewers will be checked by the Contracting Officer to determine whether any displacement of the pipe has occurred after the trench has been backfilled to 2 feet above the pipe and tamped as specified. The test will be as follows: A light will be flashed between manholes, or, if the manholes have not as yet been constructed, between the locations of the manholes, by means of a flashlight or by reflecting sunlight with a mirror. If the illuminated interior of the pipe line shows poor alignment, displaced pipe, or any other defects, the defects designated by the Contracting Officer shall be remedied by the Contractor at its expense.

SECTION 23

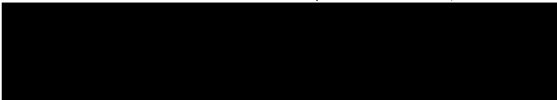
WATER LINES

23-01 SCOPE: The work covered by this section of the specifications consists in furnishing all labor, plant, equipment, appliances, and material, not furnished by the Government, and in performing all operations in connection with the construction of water lines to point approximately 5 feet outside of building or structures to which service is required, complete, in strict accordance with this section of the specification and the applicable drawings, and subject to the terms and conditions of the contract.

23-02 APPLICABLE SPECIFICATIONS: The following specifications, of the issues listed below but referred to thereafter by basic designation only, form a part of this specification:

a. Federal Specifications:

O-B-441a	Bleaching-Material (Chlorinating Agents)
WW-P-325	Pipe, Bends and Traps; Lead (for) Plumbing and Water Distribution
WW-P-441a	Pipe; Wrought Iron, Welded, Black and Zinc-Coated
WW-P-521b	Pipe-Fittings; Malleable-Iron (Screwed), 150-Pound
WW-V-54	Valves; Bronze, Gate; 125- and 150-Pound, Screwed and Flanged (For Land Use)
WW-V-58	Valves; Cast-Iron, Gate; 125- and 150-Pound, Screwed and Flanged (For Land Use)



25X1C

c. American Water Works Association Specifications:

7F.1 Standard Specifications for Gate Valves for
Ordinary Water Works Service

23-03 GENERAL: Piping for building service connections shall be of the types and materials specified herein, shown on the drawings, or as directed by the Contracting Officer. The pipe and accessories shall be of new and unused material, unless otherwise approved by the Contracting Officer. The full length of each section of pipe shall rest solidly upon the pipe bed. Any pipe that has the grade or joint disturbed after laying shall be taken up and relaid. The interior of the pipe shall be thoroughly cleaned of all foreign matter before being lowered into the trench, and shall be kept clean during laying operations by means of plugs or other

approved methods. The pipe shall not be laid in water or when trench or weather conditions are unsuitable for the work, except by permission of the Contracting Officer. Water shall be kept out of the trench until the material in the joints has hardened. When work is not in progress, open ends of pipe and fittings shall be securely closed so that no trench water, earth or other substance will enter the pipes or fittings. Any section of pipe found to be defective before or after laying shall be replaced with new pipe without additional expense to the Government.

23-04 EXCAVATION, TRENCHING AND BACKFILLING: Excavation, trenching and backfilling shall conform to the applicable provisions of section on EXCAVATION, TRENCHING AND BACKFILLING FOR UTILITIES SYSTEMS, of these specifications.

23-05 WROUGHT-IRON PIPE:

a. Pipe: Wrought-iron pipe 3 inches and less in diameter shall conform to the requirements of Federal Specification WW-P-441a, class A, galvanized, with screw joints.

b. Specials and Fittings: Specials and fittings for galvanized wrought-iron pipe shall be galvanized malleable iron, conforming to the requirements of Federal Specification WW-P-521b, type II.

23-06 SERVICE LINES: Service lines 3 inches and smaller in diameter shall be constructed of galvanized wrought-iron pipe. Service shall include the lines to, and connections with, the building service at a point approximately 5 feet outside the building where such building service exists. All service stops and gate valves shall be provided with extension service boxes of the lengths required by the depths of the service line stops or valves. Service lines shall be constructed in accordance with the following requirements.

a. Service Lines 1½ inches and smaller: The connection to the main for service lines 1½ inches and smaller in diameter shall consist of a corporation type stop and a lead or copper gooseneck, with a service stop.

b. Two-Inch Service Lines: Service lines 2 inches in diameter shall be connected to the main with a rigid connection and shall have a gate valve. The gate valve shall be provided with a cast-iron valve box of extension type with screw or slide type adjustment and with flared base.

c. Miscellaneous Items:

(1) Service Stops: Service stops shall be waterworks ground-key type, oval flow way, tee handle, without drain. All parts shall be of 35-5-5 cast red brass with female IPS connections and shall be designed for a minimum hydraulic pressure of 200 pounds per square inch.

(2) Service Boxes: Service boxes shall be of cast iron. Extension service boxes of the required length and having either screw or slide type adjustment, shall be installed at all service-box locations.

The boxes shall have housings of sufficient size to completely cover the service stop and shall be complete with identifying covers. Where water mains are located in paved streets having curbs, the boxes shall be located directly back of the curbs. Where no curbing exists, service boxes shall be installed in accessible locations, beyond the limits of streets, walks and driveways.

23-07 GATE VALVES: Valves shall be designed for a minimum water working pressure of not less than 150 pounds per square inch. Valves shall have bell or spigot ends or screw joints as required for the piping in which they are installed. Gate valves shall have a clear waterway equal to the full nominal diameter of the valve, and shall be opened by turning to the left. The operating nut or wheel shall have an arrow, cast in the metal, indicating the direction of opening. Each valve shall have the maker's initials, pressure rating, and year in which manufactured, cast on the body. Prior to shipment from the factory each valve shall be tested by hydraulic pressure equal to twice the specified water working pressure.

a. Valves Smaller Than 2 inches: Valves smaller than 2 inches shall be all brass and shall conform to the requirements of Federal Specification WW-V-54.

b. Valves 2 inches and Larger: Valves 2 inches and larger shall be iron-body, brass-mounted and shall conform to the Standard Specifications of the American Water Works Association, 7F.1, or to the requirements of Federal Specification WW-V-58.

23-08 STERILIZATION: Each unit of completed supply line and distribution system shall be sterilized with chlorine before acceptance for domestic operation.

a. Materials:

(1) Liquid Chlorine: Liquid Chlorine shall conform to the requirements [REDACTED]

(2) Hypochlorite: Liquid hypochlorite, shall conform to the requirements of Federal Specification C-B-441a, grade D.

b. Method: The amount of chlorine applied shall be such as to provide a dosage of not less than 50 parts per million. The chlorinating material shall be introduced to the water lines and distribution systems in a manner approved by the Contracting Officer. After a contact period of not less than 8 hours, the system shall be flushed with clean water until the residual chlorine content is not greater than 0.2 parts per million. All valves in the lines being sterilized shall be opened and closed several times during the contact period.

23-09 CLEAN-UP: Upon completion of the installation of the water supply lines, distribution system and appurtenances, all debris and surplus materials resulting from the work shall be removed.

SEWERS; SANITARY, GRAVITY

24-01 SCOPE: The work covered by this section of the specifications consists in furnishing all plant, labor, equipment, appliances, and materials, not furnished by the Government, and in performing all operations in connection with the construction of the sanitary sewers to points of connection with the building drains 5 feet outside the building to which the sewer is to be connected, complete, in strict accordance with this section of the specifications and the applicable drawings, and subject to the terms and conditions of the contract.

24-02 APPLICABLE SPECIFICATIONS: The following specifications, of the issues listed below but referred to thereafter by basic designation only, form a part of this specification:

a. Federal Specifications:

QQ-I-652	Iron, Gray; Castings
SS-A-281a	Aggregate; (for) Portland-Cement-Concrete
SS-C-192a	Cements, Portland
SS-P-371	Pipe; Concrete, Non-Pressure, Non-Reinforced and Reinforced

25X1C

24-03 GENERAL: Gravity sewers shall be constructed in conformity with this section of the specifications. Excavation, trenching and backfilling shall conform to the requirements of section on EXCAVATION, TRENCHING AND BACKFILLING FOR UTILITIES SYSTEMS, of these specifications. Work covered by this section will not be accepted until backfilling connected with the work has been completed satisfactorily. Any section of the sewer that is found defective in material, alinement, grade, or joints before acceptance shall be corrected to the satisfaction of the Contracting Officer.

24-04 MATERIALS:

25X1C

b. Concrete Aggregates: Concrete aggregates shall conform to the requirements of Federal Specification SS-A-281a, grade A.

c. Joint Packing: Joint packing shall be jute, oakum, or hemp. The material shall be dry when used with bituminous joint compound and shall be either dry or tarred with a suitable grade of pipe tar when used with cement mortar joints. The packing shall be square braided, tightly twisted, or loosely twisted as may be suitable for the type of joint.

d. Concrete Pipe: Concrete pipe and fitting shall conform to the requirements of Federal Specification SS-P-371. Pipe smaller than 24 inches in diameter shall be type I unless otherwise indicated on the drawings.

e. Portland Cement: Portland cement shall conform to the requirements of Federal Specification SS-C-192a, type I.

24-05 COATING:

a. General: All interior surfaces of concrete sanitary sewer pipe and fittings shall be lined as specified hereunder.

b. Materials: The corrosion-resistant coating shall consist of coal-tar base materials without any trace of asphalt or petroleum derivatives. The coating shall consist of processed coal-tar pitch, refined coal-tar oils and compatible resins and pigments, and shall be free of all water, benzol and other toxic solvents. The coating shall be air-drying, shall adhere perfectly to concrete and shall be unaffected by the lime or alkalis therein. Coating shall dry hard, in a dense, smooth film free of bubbles or other defects, and shall not soften or sag from the heat of the sun. Coating shall have a consistency that will permit its application at 250 square feet per gallon without running or sagging while wet. It shall be Bitumastic #170 as manufactured by the Wiles Dove-Zernston Corporation, or approved equal. Material shall be used and handled in strict accordance with the manufacturer's recommendations.

c. Application: Fittings and pipe may be coated by dipping, brushing or swabbing, at the Contractor's option. In the event that the coating becomes too thick to dry or drain well, 5 to 15 percent of a thinner approved by the manufacturer of the coating material may be added to reduce the coating material to the proper consistency. The coating shall be so applied as to cover the entire inner surface of the pipe and fittings in a continuous coat, free of bare spots and misses. The interior surfaces of all pipe and fittings shall be dry and broom-clean before the coating material is applied. Freshly-coated pipe and fittings shall be stored in such a manner as to prevent the coating from coming into contact with dirt or foreign materials which may adhere to or damage the coating.

a. Pipe Laying: The bottom of the trench shall be shapped to give substantially uniform circumferential support to the lower fourth of each pipe. Pipe laying shall proceed up grade with the spigot ends pointing in the direction of flow. Each pipe shall be laid true to line and grade in such manner as to form a close concentric joint with the adjoining pipe and to prevent sudden offsets of the flow line. As the work progresses, the interior of the sewer shall be cleared of all dirt and superfluous materials of every description. Where cleaning after laying is difficult because of small pipe size, a suitable swab or drag shall be kept in the pipe and pulled forward past each joint immediately after the jointing has been completed. If the maximum width of the trench at the top of the pipe, specified in section on EXCAVATION, TRENCHING AND BACKFILLING FOR UTILITIES SYSTEMS, of these specifications, is exceeded for any other reason than by order of the Contracting Officer, the Contractor shall install at its own expense such concrete cradling, pipe encasement, or other bedding as may be required by the Contracting Officer to support the added load of the backfill. Trenches shall be kept free from water until the pipe jointing material has set and pipe shall not be laid when the condition of the trench or the weather is unsuitable for such work. At all times when work is not in progress all open ends of pipe and fittings shall be securely closed to the satisfaction of the Contracting Officer so that no trench water, earth, or other substance will enter the pipe or fittings.

b. Jointing: Unless otherwise specified, joints in bell-and-spigot pipe shall be made with bituminous joint sealer. The sealer shall be heated to the proper temperature to permit rapid pouring and to obtain strong adhesion of the compound to the pipe. The temperature of the molten compound shall be between 350°F and 450°F unless otherwise recommended by the manufacturer. The compound shall not be overheated or subjected to prolonged heating which might cause a change in its physical properties. Before pouring bituminous sealer, the inside of the bells and outside of the spigots shall be dry and clean before pouring and shall be primed if and as recommended by the manufacturer of the sealer. The sealer shall be poured as follows: The pipe shall be centered so that the annular space is uniform. The annular space shall then be well caulked with jute, oakum or hemp packing that is free from oil and grease. The depth of the packing shall be such as to leave a space, measured from the end of the bell of at least one inch for pipes 15 inches and less in diameter and 1-1/2 inches for pipes 18 to 24 inches in diameter. When the jointing is made with the pipe in its final location, a suitable joint runner, previously dipped into thick mud or grout to permit easy removal when the joint has cooled, shall be placed around the pipe, leaving an opening at the top of the runner. The molten sealer shall be poured continuously into this opening until the joint is completely filled and shall be poured as rapidly as possible without entrapping

air. After the sealer has cooled or set, the runner may be removed. Alternate joints may be poured before the pipe is lowered into the trench. In this case the joint shall be poured with the pipe in vertical position without the use of the runner. The sealer shall have thoroughly set before the pipe is placed in the trench and the pipe shall be handled so as not to cause deformation of the joint.

c. Infiltration: If, in the opinion of the Contracting Officer, infiltration appears excessive, the amount of leakage shall be measured by a suitable weir as directed by the Contracting Officer and at the Contractor's expense.

24-07 CONCRETE CRADLE AND ENCASEMENT: The pipe shall be supported on a concrete cradle or encased in concrete where indicated on the drawings or required by the Contracting Officer. The concrete shall consist of one part portland cement, 2-1/2 parts fine aggregate, and 5 parts gravel, with just enough water to produce a workable consistency.

24-08 WYE BRANCHES: Commercially manufactured wye branches shall be installed where sewer connections are indicated on the drawings or where required by the Contracting Officer. Cutting into pipe for connections shall not be done except in special cases approved by the Contracting Officer. When conditions are such that the connecting pipe cannot be adequately supported on undisturbed earth or tamped backfill, it shall be encased in concrete or supported on a concrete cradle as directed by the Contracting Officer. Concrete required due to conditions resulting from faulty construction methods or negligence of the Contractor shall be installed at the Contractor's expense. The installation of wye branches into an existing sewer of bell-and-spigot pipe shall be made by removing one pipe section, breaking off the upper halves of the bells of the next lower section and of the section to be installed, inserting the new section and rotating it so that the unbroken half of its bell will be at the bottom. The 2 joints shall then be made with joint packing and bituminous joint sealer specified above.

24-09 CONNECTION TO EXISTING MANHOLES: Pipe connections to existing manholes shall be made in such manner that the finished work will conform as nearly as practicable to the essential applicable requirements specified for new manholes, including all necessary concrete work, cutting, and shaping.

24-10 CLEAN-UP: Upon completion of the installation of the sanitary sewers the Contractor shall remove all surplus construction materials and debris resulting from the work.

SECTION 25

ELECTRICAL DISTRIBUTION SYSTEM

25-01 SCOPE: The work covered by this section of the specifications consists in furnishing all plant, labor, equipment, appliances, and materials, not furnished by the Government and in performing all operations in connection with the installation of the electrical distribution system, complete, in strict accordance with this section of the specifications and the applicable drawings, and subject to the terms and conditions of the contract.

25-02 APPLICABLE SPECIFICATIONS: The following specifications and standards form a part of this specification:

a. Federal Specifications:

W-C-571	Conduits and Fittings; Asbestos Cement for Electrical Purposes
W-C-581	Conduits and Fittings, Fiber, Bituminized
W-C-601a	Connectors, Wire; Pressure, Solderless (for Electric Cable and Wire)
W-F-406	Fittings; Cable and Conduits
W-O-806	Outlet Bodies
W-T-631	Transformers; Distribution, Single-Phase, 60 Cycles (100 KVA and Below; 15,000 Volts and Below)
W-S-865	Switches, Enclosed (Safety)
FF-B-561a	Bolts, Lag; Steel (Lag-Screws)
FF-B-571a	Bolts; Nuts; Studs; and Tap-Rivets (and Material for Same)
QQ-I-652	Iron, Gray; Castings
QQ-W-336a	Wire; Copper, Hard-Drawn and Hard-Rolled
WW-C-581b	Conduit; Steel, Rigid, Zinc-Coated

b. National Bureau of Standards Handbook:

H32	Safety Rules for the Installation and Maintenance of Electric Supply and Communication Lines
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c. Underwriters' Laboratories, Inc.:

Standard for Service Equipment

d. National Electrical Manufacturers Association Standards:

49-145	Distribution Cutout Standards
49-144	Power Switching Equipment Standards
42-73	Transformer Standards
42-83	High Voltage Insulator Standards
44-89	Lightning Arrester Standards

e. Insulated Power Cable Engineers Association Specifications:

Wire and Cables with Rubber, Rubber-like and Thermo-plastic Insulation.

25-03 CODE: The electrical-distribution and security lighting system shall conform to the applicable requirements of the National Bureau of Standards Handbook H32, except as otherwise specified herein or indicated on the drawings. The requirements for grade B construction shall be complied with where applicable.

25-04 GENERAL: The system shall be complete with all necessary accessories for proper operation. The transformer, disconnecting devices, protective devices, and all other equipment shall be thoroughly coordinated to secure the required results. The contract drawings indicate the extent and general arrangement of the system. If any departures from the contract drawings are deemed necessary by the Contractor, details of such departures and the reasons therefor shall be submitted as soon as practicable to the Contracting Officer for approval. No such departures shall be made without the prior written approval of the Contracting Officer.

a. Standard Products: The equipment to be furnished under this specification shall be the standard product of approved American manufacturers. Where two or more units of the same class of equipment are required, these units shall be products of a single manufacturer; however, the component parts of the equipment need not be the products of the same manufacturer. Equipment and accessories shall be the product of manufacturers indicated on the drawings or their approved equal.

b. Material and Equipment Schedule: Within 30 days after the date of award of contract and before purchase of materials and equipment, a complete schedule of Contractor-furnished materials and equipment proposed for installation shall be submitted for the approval of the Contracting Officer. The schedule shall include catalogs, cuts, diagrams, drawings and such other descriptive data as may be required by the Contracting Officer. In the event any items of material or equipment contained in the schedule fail to comply with the specification requirements, such items may be rejected. If, prior to the expiration of the above specified period or any authorized extension thereof, the Contractor fails to submit a schedule of materials and equipment acceptable to the Contracting Officer, the Contracting Officer may select and designate the materials and equipment, all of which shall be furnished and installed by the Contractor without change in contract price or time of completion.

25-05 MATERIALS AND EQUIPMENT: Materials and equipment shall be as specified on the drawings and/or as specified in this section of the specification.

a. Bolts and Nuts: Bolts and nuts shall conform to the requirements of Federal Specification FF-B-571a, commercial steel, zinc-coated, and of the type and size indicated on the drawings or required.

b. Lag Screws: Lag screws shall conform to the requirements of Federal Specification FF-B-561a, zinc-coated and of the type and size indicated on the drawings or required.

c. Rigid Steel Conduit: Rigid steel conduit shall conform to the requirements of Federal Specification WW-C-581b, size as indicated on the drawings or required.

d. Solderless Connectors: Solderless connectors shall conform to the requirements of Federal Specification W-C-601a, type and size as indicated on the drawings or required.

e. Asbestos-Cement Conduit: Asbestos-cement conduit shall conform to the requirements of Federal Specification W-C-571, type I, for concrete encasement, and type II for installation without concrete encasement.

f. Cable and Conduit Fittings: Cable and conduit fittings shall conform to the requirements of Federal Specification W-F-406.

g. Cartridge Fuses: Cartridge fuses shall conform to the requirements of Federal Specification W-F-803a.

h. Fiber Conduit: Fiber conduit shall conform to the requirements of Federal Specification W-C-581, type I for concrete encasement, and type II for installation without concrete encasement.

i. Lightning Arresters: Lightning arresters shall conform to the requirements of the National Electric Manufacturers Association Standards 44-89.

j. Outlet Bodies: Outlet bodies shall conform to the requirements of Federal Specification W-C-806.

25-06 CROSSARMS AND FITTINGS: Unless otherwise indicated on the drawings, cross-arms and fittings shall be as hereinafter specified. Crossarms shall be straight-grained, air-dried or kiln-dried, standard crossarm-grade Douglas-fir, or close-grained, creosoted, southern pine. Crossarms shall be drilled for steel pins, through bolts, brace bolts, and double-arming bolts as applicable to the installation. Arm braces shall be 1-1/4-inch by 1/4-inch steel of adequate length, bolted to the front of the crossarm and after the arm has been carefully aligned, the braces shall be secured to the pole by means of a 1/2-inch by 5-inch lag screw. The cross-sectional dimensions of 2- and 4-pin crossarms shall be not less than 3 inches by 4 inches, and of 6- and 8-pin crossarms not less than 3-1/4 inches by 4-1/4 inches. The vertical and longitudinal strength of crossarms, and the requirements for climbing space and pin spacing shall conform to the requirements of the National Bureau of Standards Handbook H32. Double crossarms shall be provided at each line crossing, at deadends, at corners where the angle of departure from a straight line exceeds 20 degrees, and elsewhere as required to provide adequate vertical and longitudinal strength.

25-07 PINS: Pins shall be one-piece forged-steel with lead thread and shall be designed to carry the full strength of the pin body to the top. Pins shall be of the long-shank type and shall be equipped with lock washers and square nuts at the bottom of the crossarms. The diameter of the shank shall be not less than $3/4$ inch. Lead threads shall be securely banded to the steel and carefully formed to fit the insulator threads. Pin bases shall be of adequate diameter to ensure maximum resistance to strain. Pins shall have a height above arm of not less than $4-1/2$ inches and shall comply with the strength requirements of the National Bureau of Standards Handbook H32.

25-08 INSULATORS: Insulators for use on the primary distribution system shall be made of brown-glaze wet-process porcelain. Insulators shall be radio-free and shall conform to the requirements of the National Electrical Manufacturers Association Standard 42-83. Insulators shall be of the pin type, suspension type, strain type, or clevis type as applicable to the installation indicated on the drawing. Suspension type insulators shall be used on the primary system wherever pins do not provide adequate strength. The 60-cycle, wet flashover voltage of insulators for circuits operating from 4000 to 7000 volts shall be not less than 30,000 volts, unless otherwise indicated on the drawings.

25-09 POLE LINE HARDWARE: Pole line hardware shall be hot-galvanized. Suitable washers shall be installed under bolt heads and nuts on wood surfaces. Washers used on through bolts and double-arming bolts shall be approximately $2\frac{1}{4}$ inches square and $3/16$ inch thick. The diameter of holes in washers shall be the correct standard size for the bolt on which they are to be used. Double-arming bolts equipped with 4 nuts and 4 washers shall be installed for each double-arm installation. Eye bolts, bolt eyes, eye nuts, strain plates, and clevises shall be used wherever required to adequately support and protect the poles, cross-arms, guy wires and insulators.

25-10 OVERHEAD LINE CONDUCTORS: Primary overhead line conductors shall be hard-drawn bare copper wire conforming to the applicable requirements of Federal Specification QQ-W-336. Conductors larger than No. 2 AWG shall be stranded. Line wires shall be tied to insulators in an approved manner. Tie wires shall be soft copper of the same size and insulation as line wires up to and including No. 2 AWG. Larger sizes shall be tied with No. 2 AWG. Care shall be taken in handling and stringing the conductors to guard against cuts, scratches or kinks.

25-11 SWITCHES: Switches for use on secondary circuits operating at 600 volts or less shall be of the type and rating indicated on the drawings or specified. Switches shall conform to the applicable requirements of the Standard for Service Equipment of the Underwriters' Laboratories, Inc.

25-12 LIGHTNING ARRESTERS: Lightning arresters shall conform to the applicable recommendations and requirements of the National Electrical Manufacturers Association Standard 44-89. Arresters shall be equipped with suitable mounting brackets for the applicable method of mounting and shall be connected to an underground metallic water pipe, connected to a water supply system and having a nominal diameter of one inch or larger, wherever such a pipe is available within 15 feet of the installation. Where

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a water pipe of suitable size. The ground shall be made to a 3/4-inch copper or copper-clad steel ground rod. The ground rod shall be driven at least 8 feet into the ground approximately 3 feet out from the base of pole. After installation is completed, the top of ground rod shall be approximately one foot below finished grade. The grounding conductor shall be soft, weatherproof wire conforming to the applicable requirements of the National Bureau of Standards Handbook H32 and shall be stapled to the pole at intervals not exceeding 3 feet. The ground conductor for pole transformer arresters shall be protected by a half-round wood molding from the ground line to a point at least 8 feet above the ground line and throughout the communication space. The wood molding shall be stapled to the pole at intervals not exceeding 2 feet. Connections shall be made with solderless connectors. Unless otherwise indicated on the drawings, one arrester shall be provided for each line wire to transformer installation, except grounded line.

25-13 TRANSFORMERS: Transformers shall be of the oil-immersed, self-cooled, outdoor, 2-winding type unless otherwise noted on the drawings. Transformers shall be of the ratings indicated on the drawings. Transformer installations shall include one primary fuse cutout or fused disconnects and one lightning arrester for each phase wire. Fuse links shall have a current rating equal to 150 percent of the transformer full-load rating, or the next larger standard size. Single-phase, 60-cycle, distribution transformers, 100 KVA and below, 15,000 volts and below, shall conform to the requirements of Federal Specification W-T-631, except that taps shall be provided as recommended by the National Electrical Manufacturers' Association Standards for Transformers. Other transformers and accessories shall comply with the applicable recommendations, regulations and standards of the National Electrical Manufacturers' Association Standard and the ASA Standard C57. All auxiliaries shall be coordinated to ensure proper operating sequence.

25-14 PRIMARY FUSE CUTOUTS: Primary fuse cutouts shall conform to the requirements of the National Electrical Manufacturers' Association Standard 49-145. Primary fuse cutouts for use on systems operating at distribution system voltages of 7,000 volts or less to ground shall have a voltage rating of at least 7,500 volts. The interrupting capacity of primary fuse cutouts having a capacity of 50 amperes or less shall be not less than 1,200 amperes at rated voltage. The interrupting capacity of larger cutouts shall be not less than 2,000 amperes at rated voltage. Fuses shall have a continuous rating equal to approximately 150 percent of the full-load line current when used for transformer protection and approximately 100 percent of the conductor rated capacity when used for circuit protection.

25-15 GROUNDING: Neutral conductors, and non-current-carrying metallic parts of equipment at each transformer installation shall be grounded to an underground metallic water pipe, connected to a water supply system and having a nominal diameter of one inch or larger, wherever such a pipe is available within 15 feet of the installation. Ground systems at transformer station shall be as shown on the drawings. Where a water pipe of suitable size and location is not available, 3/4 inch copper or copper-clad steel ground rods, driven into the earth at least 8 feet, shall be used for grounding. The total ground resistance at each rod installation shall not exceed 25 ohms. If this resistance cannot be obtained with a single rod, a sufficient number of additional rods shall be installed within that

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that limit. The distance between ground rods shall be not less than 6 feet. The distance between ground rods and pole shall be not less than 3 feet. After installation is completed, the top of ground rods shall be approximately one foot below the finished grade. The grounding conductor shall be soft, weatherproof wire conforming to the requirements of the National Bureau of Standards Handbook H32, and shall be stapled to the pole at intervals not exceeding 3 feet where applicable. The ground conductor shall be protected by a half-round wood molding from the ground line to a point at least 8 feet above the ground line and throughout the communication space. The wood molding shall be stapled to the pole at intervals not exceeding 2 feet. Connections shall be made with solderless connectors. In transformer station, the grounding system shall be as shown on the drawings.

25-16 SECONDARY CABLE SYSTEM: The secondary cable system shall consist of non-metallic sheathed cable for direct burial in the ground or installation in ducts or conduit as indicated on the drawings. The size and number of conductors and the number of cables shall be as noted on the drawings. Secondary cable shall have a voltage rating of at least 600 volts. Conductors larger than No. 8 AWG shall be stranded. Non-metallic sheathed cable shall be buried directly in the ground, at least 2 feet below finished grade, except under roads or other paved areas. Where non-metallic sheathed cables cross under roads or under paving exceeding 5 feet in width it shall be installed in fiber, or asbestos-cement conduit. If paving is in place when the cable is installed, a wrought-iron pipe driven under the tracks or paving may be used in lieu of the non-metallic conduit. Conduit or pipe shall extend at least 1 foot beyond the edge of paving. Neutral conductor shall be bare copper wire buried in the cable trench bottom, unless otherwise indicated on the drawings or specified elsewhere.

a. Non-Metallic Sheathed Cable: Conductor and insulation shall conform to the applicable requirements of Federal Specification J-C-121(1). Sheath shall conform to the applicable requirements of the Insulated Power Cable Engineers Association General Specifications for Wire and Cable with Rubber or Rubber-Like and Thermoplastic Insulation and shall be polychloroprene.

b. Splices: Buried splices in cable will not be permitted in runs of 500 feet or less and at intervals of less than 500 feet in longer runs, except as required to avoid damage to the cable or obstructions. Splices shall be accomplished in a manner to provide insulation and other characteristics equal to the insulation and sheath of the cable and shall be as recommended by the manufacturer of cable and approved by the Contracting Officer. Connectors shall be solderless type conforming to the requirements of Federal Specification W-C-601.

c. Service Connections to Buildings: Service cables shall be extended into the various buildings indicated on the drawings and shall be properly connected to the main service equipment. Empty conduits, from a point outside the building to the main service is covered under the section on ELECTRICAL WORK, INTERIOR. Loads shall be provided as evenly as practicable on the various phases of the system.

d. Excavation and Backfilling: Excavation and backfilling shall conform to the applicable requirements of the section on EXCAVATION, TRENCHING AND BACKFILLING FOR UTILITY SYSTEMS, of these specifications, except that non-metallic sheathed cable shall be provided with a cushion and cover of approved sand. Cushion below and at the sides of the cable shall be not less than 3 inches thick, and the cover above the cable shall be not less than 6 inches thick, except as otherwise indicated on the drawings.

25-17 REMOVAL OF EXISTING LINES: Where indicated on the drawings or specified, existing lines shall be removed. All materials shall be handled in such a manner as to avoid damage. Hardware and insulators shall be properly sorted and crated. Wires shall be sorted as to type and sizes and properly rolled into rolls of convenient weight. Poles shall be removed including buried butt unless, due to deterioration, some poles are permitted by the Contracting Officer to be cut off at ground level. All materials shall be transported to storage points indicated by the Contracting Officer.

25-18 TEST: After the installation is completed, and at such time as the Contracting Officer may direct, the Contractor shall conduct an operating test for approval. The equipment shall be demonstrated to operate in accordance with the requirements of this specification. The test shall be performed in the presence of the Contracting Officer or his authorized representative. The Contractor shall furnish all instruments and personnel required for the test, and the Government will furnish the necessary electric power.

SECTION 26

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

26-01 METHOD OF MEASUREMENT: Work required under these specifications will be measured for payment, in place, by the units of measurement indicated on the Unit Price Schedule.

26-02 BASIS OF PAYMENT: Payment will be made for the actual quantities measured in place, in accordance with the provisions of the preceding paragraph, at the contract unit price for each item of work shown in the Unit Price Schedule, which payment shall constitute full compensation for furnishing all supervision, plant, labor, materials, equipment, supplies, transportation, including fuel, power and water (except any materials, equipment, utilities or services, if any, specified herein to be furnished by the Government) and for performing all work required to complete each item in strict accordance with the specifications, schedules and drawings, and subject to the terms and conditions of the contract.

APPENDIX A

GOVERNMENT-FURNISHED MATERIALS



25X1A

<u>Item No.</u>	<u>Quantity</u>	<u>Unit</u>	<u>Description</u>
1.	8	Ea	Hot water heaters, 40-gallon capacity
2.	4	Ea	Hot water heaters, 30-gallon capacity
3.	12	Ea	Furnaces, Forced Warm Air, 28,000 BTU (less grilles and ducts)
4.	1	Ea.	Transformer, $37\frac{1}{2}$ KVA (To be furnished by (Using Agency)

NOTE: The Using Agency will furnish and install refrigerators and electric ranges. However, the Contractor will furnish all receptacles and flexible cords for connection of electric ranges.